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ADULT INTERESTS



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ADULT INTERESTS

BY

EDWARD L. THORNDIKE

AND THE STAFF OF THE DIVISION OF PSYCHOLOGY OF
THE INSTITUTE OF EDUCATIONAL RESEARCH OF
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

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PREFACE

THIS book is intended for workers in adult education and for students preparing to become teachers of adults. It has seemed best to secure clearness and brevity even though this entails dogmatism, apparent neglect of psychological doctrines which are held widely, and possibly over-confidence in results obtained by us but not yet confirmed by others or generally accepted. We believe that practice based on these results, even if in need of some modifications, will, on the whole, be much better than the traditional practices which it replaces.

The principles expounded in Chapters III, IV and VI are as true of children and adolescents as of adults and should be of interest to all students of education. The surprising experiments reported in Chapter V should be repeated with children. If the results are, as I expect they will be, substantially similar, current theories of interest in elementary and secondary education need revision.

EDWARD L. THORNDIKE.

August, 1934.

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ADULT INTERESTS

CHAPTER I

INTRODUCTION

FOR thousands of years it was an avowed or tacit assumption of human education that learning belonged primarily to infancy and childhood. People did and should learn then most of the facts, principles, habits and skills which they used in later years. The young were supposed to amass a store of information and ability, the income from which supported them through life.

This assumption, though questioned occasionally by thinkers, persisted as an accepted and acceptable basis of orthodox theory and practice until recently. It is now seriously challenged for two reasons — that it would be unfortunate under present conditions if it were true, and that it is in fact false.

It would now be unfortunate if learning were restricted chiefly to childhood and youth, first, because the world is changing so fast that what one learns from 5 to 20 is often not useful from 35 to 60; second, because men and women have now so much leisure time that they could, if they had the ability, keep up with the changing world; third, because the diffusion of power from the few to the many makes it desirable that the many learn more than they do or can learn in childhood. Other justifications could well be added. Well-informed and intelligent students of human affairs will agree that trustworthy knowledge of the possibilities of learning in adult years should replace proverbs and taboos in determining educational policy and action.

The assumption was shown to be false by the experiences of everyday life and of schools for adults. In an

earlier volume (*Adult Learning*) we confirmed this by experimental evidence and also measured roughly the changes in the ability to learn up to age 45. We showed that the ability to learn increased from early childhood to about age 25 and decreased gradually and slowly thereafter, about one percent per year. Childhood was found to be emphatically *not* the best age for learning in the sense of the age when the greatest returns per unit of time spent are received. The age for learning that is best in that sense is in the twenties, and any age below 45 is better than ages 10 to 14.

Later investigations by Miles, Jones, and others make it probable that the decline in ability to learn from age 45 on to 70 is not much more rapid than this, so that a man of 65 may expect to learn at least half as much per hour as he could at 25 and more than he could at 8 to 10.

These results perform the useful service of assuring any adult (using that word here and later to mean a person age 21 to 70) who is not demented that he can learn most of what he needs to learn, and with little or no greater time cost than at age 15. They also show that certain changes in opinions, beliefs, skills, customs, etc., need not necessarily lag a generation because only the young can acquire them. They remove certain impediments to progress, and strongly suggest the desirability of providing facilities for learning by adults.

They do not, however, guarantee that adults will in fact learn much more in the future than they did fifty years ago. There are other causes for the decrease in learning with age than the superstition that one cannot learn, and the failure of society to provide facilities for learning by the old. Among these other causes is the lack of interest in learning.¹ Learning always requires time

¹ The reader is referred to *Adult Learning*, Chapter XI, for a general description of the causes why adults do learn so much less than they could learn.

and usually requires some care and effort. It competes for an adult's leisure time and attention with a host of other possible activities — sleep, rest, relaxation, excitement, display, combat, physical and mental exercises of uninstructional sorts, productive labor beyond what is prudent, family devotion, religious observances, and many others. To occur, it must be preferred above these, must be more desired, more interesting, either for its own sake or for some consequences expected from it.¹

With learning as with any activity, ability must be supplemented by interest or desire. If we wish adults to learn a certain thing, we must arouse adequate interest. If we ourselves wish to learn a certain thing we must transmute this general wish into an interest that will carry us to and through the detailed activities necessary. Adult education, including self-education, should be guided by a sound psychology of adult interests.

We have been engaged for three years in a study of interests and motives in relation to learning, especially in the case of adults. The results of this study are or will be reported in various articles in psychological and educational journals, and in two books, *The Psychology of Wants, Interests and Attitudes* and the present volume. The former presents general facts and principles useful for adult education because useful for all education. This book presents facts that specially concern adult interests and also recommendations concerning adult education based upon them. This book may be read profitably without acquaintance with the *Psychology of Wants, Interests and Attitudes*, but if both are to be read, there is some advantage in reading the present volume first.

¹ This is true in the long run, but occasionally a person may spend time in learning by sheer force of habit, or suggestion, or accident, without really wanting to, just as a man may go to church or to a party, without really wanting to.

CHAPTER II

CHANGES IN THE INTENSITY OF INTERESTS WITH AGE

IN this chapter we shall inquire first how the general mass or volume of a person's interests changes with age, and later how certain special interests which are important for learning change. If the general total of liking and zeal which characterizes a person becomes less as soon as youth is passed, and if this is a basic, unavoidable feature of the course of life, all plans for the guidance of interests should recognize the fact and allow for it.

It is customary to speak of one person as having more interests than another person and of one person as having a certain interest more intensely than another person. In the same way we may say that John Doe at age 45 had more (or fewer) interests than he had at age 25, or that his interest in, say, making money is greater (or less) at 45 than at 25. If an impartial inventory of his interests with some statement of the amount or intensity or degree of each was compiled at 25 and a comparable inventory at 45, it might be possible to show that the general mass or volume or total of interest had increased or decreased. If, for example, he had at 45 only half the interests he had at 25, and no new ones, and if those he retained were obviously weaker than before in all instances, the direction of the change would be indubitable. In less simple cases, if impartial estimates of the mass or volume or total of interest at 25 and at 45 were made, these might still be compared, even though the interests were not identical and the amounts were not in defined units of any sort. So nobody has any hesitation in asserting that the total

volume of interest of Richard Roe at 25, when he was on fire with loves and hates, pushed by ambition for success in his profession, etc., etc., was greater than the total volume for him at 75, when he dozes all night and most of the day, though he has an extreme interest in sitting in a certain chair, in having his commands obeyed, and in telling unimportant details of his early prowess.

As a result of such rough and ready observations and intuitive comparisons of the young with the very old, there has developed the ordinary opinion that the general total mass or volume of interest (i.e., of positive interests or likings) decreases greatly from youth to old age. As to when and how the decrease occurs, ordinary opinion is silent.

To obtain information concerning the amount of the change and the way in which it occurs, the writer appealed to members of his class in college and of neighboring classes and to various alumni of Teachers College who were among his students from 1899 to 1904, requesting information as stated in the Instruction Sheet and Record Sheet shown on pages 6 and 7. The list of interests evaluated was chosen to include none which could ordinarily be gratified only at young ages (e.g., in going to school or in falling in love) or only at old ages (e.g., in the progress of one's children) and none which were highly specialized. It was chosen to include the staple activities in which civilized males spend perhaps nine-tenths of the time not spent in eating, sleeping, and sex indulgence. It would have been well to have added an item to cover working with tools, tinkering and similar skilled acts.

INSTRUCTION SHEET: ADULT INTERESTS

Please consider the activities listed on the Record Sheet from the point of view of your interest in them at the age periods noted at the top of each column. Enter a number from +5 to -5 for your degree of like or dislike for each of these activities at age 20 to 29; then do the same for age 30 to 39; then for age 40 to 49; then for age 50 to 59; then for age 60 to 69. You will, of course, not enter in the 60 to 69 column unless you are over 60 now, and will not enter in the 50 to 59 column unless you are over 50 now, etc. The meanings of the numbers from -5 to +5 are to be as follows:—

- 5 Extremely unpleasant; comparable to having a dentist work on my teeth, to a bad headache, or to being made a fool of in public.
- 4 Very unpleasant, but not quite so bad as -5.
- 3 If you doubt whether to rate your dislike -4 or -2, call it -3.
- 2 Would never do except from duty or as a means to some desired end.
- 1 Mildly disliked rather than liked.
- 0 Indifference; neither liked nor disliked.
- +1 Mildly liked.
- +2 Would do without hesitation if I had the chance, and if nothing more interesting was available.
- +3 If you are in doubt whether to rate your liking +2 or +4, call it +3.
- +4 Very enjoyable, but not quite so much so as +5.
- +5 As much liked as almost anything I can think of.

It is not expected that you will give testimony of high reliability in these ratings. If you can spare the time, please, write A after the numbers for which your memory is so certain that you would be willing to swear to them in a court of law, and write X after any numbers which you think are mere guesses. The entire record will, of course, be kept absolutely confidential.

If you would like additional copies of the Record Sheet for use with relatives or friends, I will be glad to send them and to receive the records.

RECORD SHEET: ADULT INTERESTS

To be mailed to Edward L. Thorndike, Teachers College,
Columbia University, New York

- A. Name
- B. Age.....
- C. Main occupation at age 20 to 29
- “ “ 30 to 39
- “ “ 40 to 49
- “ “ 50 to 59
- “ “ 60 to 69

Degree of Interest (Liking + and Disliking -)

	20-29	30-39	40-49	50-59	60-69
1. Reading fiction	-----	-----	-----	-----	-----
2. Reading non-fiction (except newspapers)	-----	-----	-----	-----	-----
3. Reading the newspaper	-----	-----	-----	-----	-----
4. Outdoor sports, not competitive (hunting, fishing, swimming, hiking, etc.)	-----	-----	-----	-----	-----
5. Outdoor competitive games	-----	-----	-----	-----	-----
6. Sedentary games (cards, chess)	-----	-----	-----	-----	-----
7. Dancing	-----	-----	-----	-----	-----
8. Playing a musical instrument	-----	-----	-----	-----	-----
9. Listening to music	-----	-----	-----	-----	-----
10. Theatre or movies	-----	-----	-----	-----	-----
11. My regular job	-----	-----	-----	-----	-----
12. Politics	-----	-----	-----	-----	-----
13. Welfare work (in community organizations, the church, etc.)	-----	-----	-----	-----	-----
14. Talking with old friends	-----	-----	-----	-----	-----
15. Making new acquaintances	-----	-----	-----	-----	-----
16. Traveling and seeing new places	-----	-----	-----	-----	-----
17. Sheer idleness, doing nothing and thinking of nothing	-----	-----	-----	-----	-----

As a first sample of the results, consider the changes reported for interests 1 to 16 from the twenties to the fifties by a group of 20 men engaged since college days in the Christian ministry. For each individual we compute the reported change in each interest by subtracting each entry in the 20-29 column from the corresponding entry in the 50-59 column. In the case of reading fiction three clergymen showed a change of -2 ; six, a change of -1 ; eight, a change of 0 ; one, a change of $+1$; one, a change of $+2$; and one, a change of $+4$. The central tendency is thus to a change of about -0.5 . Nine had losses; eleven had zero changes or gains. In the case of reading non-fiction, the changes were: nine of 0 , five of $+1$, one of $+2$, three of $+3$, and two of $+4$. The central tendency is thus to a change of about $+0.5$. Nine had zero changes; eleven had gains. The central tendency of the change for each activity in the case of twenty clergymen is shown in column 1 of Table 1.¹ There were shifts down, but most of these were balanced by shifts up. Thus losses of interest in fiction, outdoor sports and games, are counter-balanced by gains in interest in non-fiction, newspapers, listening to music, etc.

Consider next the facts for a group of 38 male teachers, a group of 20 lawyers and business men, and a group of 20 women teachers. The median amount of change for each group in the case of each interest is shown in Table 1, columns 2, 3, and 5.

If these results may be taken at or near their face value, the decrease in the general mass or volume of interest is so slight that plans for adult education may disregard it. Possibly, however, these college students of the nineties, being a body selected for ability and enterprise, maintain the zest of life longer than the general run of the popula-

¹ As central tendency we use whichever half-point (-2 , -1.5 , -1 , -0.5 , 0 , $+0.5$, $+1.0$, $+1.5$, $+2.0$, etc.) on the scale of loss and gain divides the changes into two most nearly equal halves. The facts in detail are presented in Appendix I.

tion. As a check on this possibility, Dr. Lorge obtained records from twenty-three men, immigrants or the children of immigrants, seventeen of whom were at work

TABLE 1

Median changes in reported interests from 20-29 to 50-59

	1	2	3	4	5	6
	Clergymen	Teachers	Lawyers and business men	Non-college group	Women Teachers	Psychologists
Fiction	-0.5	-0.5	-1.0	-1.0	0	-0.5
Non-fiction	+0.5	+0.5	0	0	+1.5	+0.5
Newspaper	+0.5	+1.0	+0.5	0	+1.0	+1.0
Sports	-0.5	-1.0	0	-1.0	0	-1.0
Outdoor games	-1.0	-1.5	-1.0	-1.0	-0.5	-1.5
Sedentary games	0	0	0	0	0	-0.5
Dancing ¹	0	-0.5	-2.0	-2.5	-2.0	-1.0
Music, playing ¹	0	0	0	0	-0.5	0
Music, listening	+0.5	0	0	0	0	0
Theatre	0	-0.5	-0.5	0	0	0
Regular job	+0.5	0	0	0	0	0
Politics	0	0	0	0	+0.5	0
Welfare	+0.5	0	0	0	0	0
Old friends	+1.0	+1.0	0	0	0	0
New acquaintances	+0.5	0	0	-1.0	0	0
Travel	0	0	0	0	0	0
n	20	38	20	23	20	20

from age 15 on. These twenty-three men were, at age 50-59, skilled workmen, proprietors of small businesses, or retired. The central tendencies of their changes for each interest are shown in column 4 of Table 1. They do not differ appreciably from the college groups.

¹ Some of the reports showing zero change in the case of dancing and playing a musical instrument are of 0 interest at all ages, and these may be made in some cases because the person had no experience of these activities. I have computed medians omitting the all-zero cases. The result upon the changes from the twenties to the fifties is to replace the entries in Table 1, column 2 by -1 and -0.5, those in column 3 by -2.5 and -0.5, and those in column 6 by -1 and -1.

It is conceivable that the records both of the college men and the men engaged in small businesses may be afflicted with large errors of memory and judgment which swamp the changes that really occurred in these persons' lives. Though conceivable, this is demonstrably not the case. The writer is able to check from personal knowledge the statements of interests from 20 to 29 (and also those concerning interests from 15 to 20, which were by his special request added to some of the records) in the case of many classmates and fraternity mates, and the statements for all ages in the case of lifelong friends or acquaintances. The records which were rated high for certitude show the same trend as the others. The ratings and the changes in them are in accord with objective facts about the persons where these are known.

It is also conceivable that there are systematic errors whereby a given rating, say of +3, for a late period means less interest than the same rating for an earlier period. If the person's +5 for the twenties meant a much keener enjoyment than his +5 for the fifties, the zero obtained from records of +5 at both periods would hide a real decline. The ranking of interests within the same period might be accurate, but the differences from one period to another could still be grossly inaccurate, and in ways that would mislead.

Until some ingenious worker with interests devises means of measuring them objectively and in units that are constant regardless of age from twenty to sixty or later, there will be no guaranteed security against such errors due to changing standards in our memories of interests at the different ages. But we can discover whether our results are seriously affected by such errors and to what extent in two ways. First, we may secure responses to our inquiry from psychologists, who are well aware of the danger of such changes in standards and would try to guard against them. Second, we may consider separately

those cases (a) where the rating for the twenties or for the fifties was at 0, or (b) where there was a change from + to - or - to +. These cases are immune to the error of shifting standards, since 0 or indifference does mean the same objective fact at 50 as at 20, namely that the person would do nothing either to obtain or to avoid the condition in question.

We have used both of these ways. The central tendencies of the changes for twenty psychologists appear in column 6 of Table 1. They show no more differences from those of the group of men teachers than would be expected by chance from the small size of the samples. The cases where either the rating for the twenties or that for the fifties was at 0, or where the two were of different signs, complete the proof that the differences in total mass or volume of interest from age 20-29 to age 50-59 are small. For fiction, outdoor sports and games, dancing and playing music, in which Table 1 shows a general decline, they show 14 gains, 77 zero changes and 85 losses. For reading non-fiction and newspapers, and talking with old friends they show 10 gains, 5 zero changes and 1 loss. For listening to music, movies and the theatre they show 9 gains, 6 zero changes, and 7 losses. For all other interests except that in sheer idleness they show 27 gains, 29 zero changes, and 44 losses. If we leave out the vigorous physical activities (sports, games and dancing, which show 10 gains, 39 zero changes and 71 losses) and sheer idleness (3, 5, and 1 respectively) we have 50 gains, 78 zero changes and 66 losses. The above figures do not include the non-college group of men, nor the women teachers. The facts for them are to the same effect.

We turn now to the consideration of changes in certain interests of special importance for adult education, especially, 2, reading non-fiction (except newspapers); 9, listening to music; 11, my regular job; 12, politics; and 13, welfare work.

The central tendencies of the changes for these interests in the various groups shown in Table 1 indicate that the degree of interest to be expected in general is a little greater at 50-59 than at 20-29. This is substantiated by obtaining for each person the balance of gains and losses in interests 2, 9, 11, 12 and 13, taken together. Of the 20 clergymen, 15 show a balance of gains; 3 show 0. Of the 38 teachers, 25 show a balance of gains; 6 show 0. Of the 20 business men and lawyers, 11 show a balance of gains; 3 show 0. Of the 23 non-college business men, 11 show a balance of gains; 5 show 0. Of the 20 women teachers, 15 show a balance of gain; 1 shows 0. Of the 20 psychologists, 9 show a balance of gain; 5 show 0.

The decrease in the total volume of interest from the twenties to the fifties is thus slight, and is restricted largely to physical activities. The interests most needed to support adult learning show no decrease.

In them there is no steady, unavoidable decline, not even a drop of one percent per year, such as is found for the ability to learn.

These conclusions are so important that we have checked them further by interviewing thirty men representing a somewhat lower average of worldly success than the non-college business group. All were residents of the same town.¹ Their occupations were: assistant foreman, baggage master and freight superintendent, carpenter, carpenter and farming, chief telegraph operator, electric house wiring, factory worker (5), fireman and engineer in factory, foreman, investigator, laborer (3), letter carrier, machinist, meat-cutter, merchant, motor-truck driver, owner of grocery store, poultry business, railroad employee, real estate and mill watchman, shoemaker, signal work on railroad, traveling salesman, undertaker.

¹ We are indebted to Dr. Robert Hoppock and Mr. Wallace P. Thornton for these records.

The detailed facts for these thirty men are reported in Appendix I. The median changes from the twenties to the fifties are -0.5 for 4 and 5 (outdoor sports and outdoor competitive games) and 0 for all the other items. It is well to compute the average changes also, since these men found it hard to make fine distinctions in their likes and dislikes and tended to report $+5$, 0 and -5 much oftener than the college groups or the teachers. The averages are: reading fiction, $+.1$; reading non-fiction (except newspapers), $+.3$; reading the newspaper, $+.6$; outdoor sports, not competitive (hunting, fishing, swimming, hiking, etc.), -1.2 ; outdoor competitive games, -1.3 ; dancing, $-.9$; playing a musical instrument, $-.3$; listening to music, 0; theatre or movies, $-.3$; my regular job, $-.1$; politics, $+.1$; welfare work (in community organizations, the church, etc.), $+.4$; talking with old friends, $+.2$; making new acquaintances, 0; traveling and seeing new places, $-.4$.

4, 5, and 7 show the largest losses as in the other groups. 2, 3, and 13 show gains. The others show no appreciable change. Omitting 4, 5, and 7 there is a very slight gain. If we sum for each person the changes in 2, 9, 11, 12, and 13, we find 4 cases of loss, 16 of no change, and 10 of gain. The facts for this group thus support emphatically the conclusions that there is only a slight decrease in the general volume of interest and none at all in the interests chiefly needed for adult learning.

The change from the fifties to the sixties is of very much less importance to adult education than the change from the twenties to the fifties, and the facts will be presented very briefly. I combine in one group the twenty-two males who had reached 65 or more at the time of their reports. The reported changes from the fifties to the sixties were as shown in the table on the following page, $+$ meaning toward greater interest and $-$ toward less.

All were negative or zero except reading the newspaper and being idle. All were slight.

	<i>Median</i>	<i>Average</i>
Reading fiction	0	0
Reading non-fiction . . .	0	0
Reading newspapers . . .	0	+0.1
Outdoor sports	0	-0.2
Outdoor games	0	-0.4
Sedentary games	0	-0.1
Dancing	0	-0.1
Music (playing)	0	0
Music (listening)	0	0
Theatre, movies	0	-0.2
Regular job	0	-0.4
Politics	0	0
Welfare work	0	-0.3
Old friends	0	0
New acquaintances	0	-0.4
Travel, sightseeing	0	-0.2
Idleness	0	+0.3

CHAPTER III

THE CONTROL OF ADULT INTERESTS

THE work of adult learning is not impeded by a general drying up of the wells of interest, nor by a decrease in the interests in observing, reading, listening, or performing acts of skill, on which learning is specially dependent. Adults may excuse themselves from learning because they are tired or sleepy or in need of entertainment rather than improvement, but not because they cannot, being old, be sufficiently interested. The few individuals who do suffer from a genuine general apathy are exceptions that prove the rule, and are balanced by the few who at forty to sixty are much more interested and zealous than ever before.

If then a person finds himself prevented by lack of interest from learning something which he ought to learn, the lack will almost always be in the way his interests are directed, not in their total quantity. He has power to enjoy and need only to teach himself, or be taught, to be interested in the topic or activity, which he ought to learn, so that he will have enough enjoyment from learning it to maintain the learning process. This chapter will present facts showing how far he can thus teach himself, or be taught, a changed attitude of greater interest in learning Spanish, typewriting, economics, the proper feeding of children, or whatever is to be learned.

The lack to be remedied may vary in its manifestations. The person may know in his heart of hearts that he should learn a certain thing (call it A), but doing so may be so

unattractive to him that he pretends to himself that now is not the time, or that B is more important than A, or that some other good reason prevents. He may frankly admit the desirability of learning A, but its lack of attractiveness may prevent him from even trying. He may start the work of learning, but abandon it because he does not like it. In this case too he may either hide the real cause, lack of interest, from other persons and even from himself, under various alleged reasons, or he may frankly admit it. He may force himself to continue the work to some respectable degree of proficiency, perhaps to completion, counterbalancing the lack of intrinsic interest in it by his interest in maintaining his own self-respect and the good opinions of others, and in attaining the benefits resulting from learning A.

Various special arrangements may be needed to fit these and other individual differences. Three general facts must be determined for all. These are the answers to three questions: Can interests be modified? How far can they be modified? What forces can be used to modify them? We shall report the answers to these questions in the case of adults.

Interests can be modified. Experiments to be reported later show that likes and dislikes can be learned by adults as truly as names or dates. The same general fact is witnessed by observations of daily life. Men who had no interest in child-development, as fathers, often acquire it. Women who had no interest in athletic records sometimes acquire it indirectly through their interest in their sons and daughters. The interest in gambling grows rapidly in certain minds when it appears respectable, as in stock speculation or contract bridge. Parts of such changes may be explainable without assuming genuine learning, but not all.

The amount of modification of interests is, however, restricted in important ways. Almost all wants, in-

terests and attitudes have premiums or handicaps by original nature or past training or both. An interest could conceivably be so strong that neither repetition nor reward could make it much stronger. For example, the liking for sleep might be already so strong that no force could make the person sleep ten percent more than he does. Contrariwise, an interest could be so strongly opposed by a contrary interest that nothing that was done could raise the former to sufficient strength to overcome the latter and determine the course of behavior. For example, the interests of women in health and economy in the matter of dress may in certain respects be so strongly opposed by the interest in securing approval and avoiding ridicule and scorn that the strengthening of an interest in rational dress reform might be foredoomed to fall short of practical success. Women might learn to wear the reasonable clothes, but not to enjoy doing so. Learning facts, intellectual habits and principles, and skills is usually rather neutral, or at least free from extreme opposition. Ordinarily a person would as readily learn that *amo* means 'I love' as that it means any other phrase, as readily learn to throw a ball in one direction as another. But teaching boys to *like* to solve grammatical problems meets with resistance, whereas teaching them to like to play base-ball is so facilitated that the teaching is almost unnecessary. Men might by training attain a world where everybody turned the other cheek when smitten, and treated their neighbors exactly as themselves, but the inborn springs of human nature would have to change before men would enjoy such individual pacifism or really love their neighbors as themselves.

Within the limitations set by the inherited nature of man and of individual men, there can probably be sufficient modifications of wants, interests, and attitudes for the purposes of present-day adult education, if suitable

forces are applied and suitable methods are used. A person who has the ability to learn a certain science or art, but has been estopped from doing so by lack of interest, can probably acquire the interest if he wants to acquire it.¹

Concerning the answer to our third question, "What forces can be used to modify interests?" there has been a diversity of opinion and a regrettable confusion and superficiality. The suggestions put forth by psychologists, educators and moralists may be grouped under the headings of *contiguity*, *suggestion*, *imitation*, "*conditioning*" and *selection by rewards and punishments*.

CONTIGUITY

Advocates of contiguity assert that anything may be made interesting by putting it with interesting things, that, for example, liking for the teacher of algebra will cause a liking for algebra. If adults were to be led to like to learn the facts of economics, a wise policy would be to have a duke or a labor-leader authorize the course, hold it in a pleasant room, get together a group who liked to be together, engage a teacher who was personally attractive, hold an occasional pleasant party after the class, and the like. The interest is supposed to flow over from these interesting features to the subject of economics and the learning of it, which is contiguous with them in the learner's life. It is supposed to flow over by reason of the mere fact of such contiguity. Any experience is supposed necessarily to be liked or disliked in proportion as its mental accompaniments or surroundings are liked or disliked.

There is some truth in all this. Experiments with human likes and dislikes do show such a diffusion or

¹ The facts which support this conclusion will appear later in this chapter and the next. I ask the reader to accept it now provisionally.

something closely resembling it. For example, let the reader consider his likes and dislikes for the sounds of the words listed below. Let him write L after the word if he clearly enjoys its sound, and D if he clearly dislikes its sound.

ain't	garland	muck	stink
amber	glen	patty	stone
asthma	hank	pawn	swan
belch	heather	pimple	table
blossom	heroine	quaint	tamper
brat	hoary	quarrel	tapestry
brocade	hog	radiant	thank
cad	hyacinth	regal	toga
carbuncle	illumine	rich	tranquil
cedar	incest	sable	turquoise
citadel	ineffable	sapphire	unique
clover	jade	seater	unison
coral	jubilant	serene	valiant
dope	lad	shrine	venison
drink	legal	silly	vesper
fake	lender	silvery	vintage
fatty	lilac	simple	vomit
fetter	lily	slop	ulcer
fragrant	limpid	spine	wart
funk	Madonna	splendor	yeoman

His likes and dislikes for these sounds will probably be found to have very little relation to the sounds, and a very close relation to the realities and ideas with which these words have been contiguous.¹ In records from several hundred persons, for example, the words in column L below are rated as more euphonious than those in column D by a very heavy majority, though the actual sounds are nearly alike. Contiguity in the past with things pleasant, grand, dignified, powerful, or esteemed makes a word actually sound well. Contiguity with things

¹ This will be the case unless the reader has fully counteracted the diffusion from real things, qualities, events, and ideas thereof to words used in connection with them by specialized training in phonetics or music.

painful, mean, degraded, weak, vile, or disgusting makes the very sound of the word unpleasant.

L	D
coral	quarrel
cedar	seater
quaint	ain't
kiss	hiss
mother	smother
bliss	blister
sister	cramp
champion	onion

Though containing some truth, the theory of change by accompaniments and surroundings is superficial and misleading, and practices based on it may fail or produce only a very small return for the cost of providing the accompaniments and surroundings.

SUGGESTION

The word suggestion has no accepted exact meaning in psychology, education or medicine. Its commonest uses are as a rough opposite of compulsion on the one hand and argument and persuasion on the other. And something of the sort is meant by those who favor suggestion as a means of changing interests or attitudes. "You can compel a person to do a certain thing, but you cannot compel him to like it," they would assert and, "Argument about matters of taste and feeling is notoriously ineffective. So suggest adroitly to the person the interest that you wish him to acquire."

What suggestion will be successful in any given case is very hard to foretell. In medicine and in education, the most successful practitioners with suggestion have not stated the principles of their methods in such form that generally successful use could be made of them. Sometimes the baldest of commands or assertions seems to

work well, consequently we might advise adults who wished to acquire an interest in learning, say algebra, to say, when interest lagged, "I like algebra. I like algebra. I like algebra better and better. Every day in every way I like algebra better and better." Sometimes the suggestion is hidden or camouflaged with more or less care. Sometimes great prestige on the part of the suggester seems essential. Sometimes the person who is to be changed must adopt a relaxed and passive mental state. To say "Change interests by suggestion" is then dangerously near saying "Change interests without compulsion or argument by whatever procedures work best."

I venture to offer a theory of suggestion which, though not demonstrated, will surely guide teachers and learners better than no theory at all and better than the highly improbable theory that by merely putting into a person's mind the idea that he does or will have a certain attitude or interest you insure his having it. Very briefly, the theory is that all forces operating by so-called suggestion operate by producing or preventing certain situations, or by connecting certain responses with situations, or by attaching certain after-effects to connections. Suggestions have potency by influencing a situation, connection, or after-effect.

Influencing situations. To be successful in causing a certain state in a person, a suggestion may, directly or indirectly, produce a situation which by original nature or past learning or both will evoke that state. For example to produce sleep a suggestion may arouse some situation to which the person's instinctive or habitual response is sleep. The suggestion may do this by removing or weakening tendencies which keep the person from going to sleep. To produce an interest in A, we should then try to maneuver the person into a situation, the response to which is an interest in A, or some behavior which will cause an interest in A.

Influencing connections. To be successful in this way, a suggestion has simply to connect the desired behavior as a belonging sequent to the situation in question. For example, by one or another device the person is enticed to feel interest when the situation is learning algebra.¹

Influencing after-effects. To be successful in this way, a suggestion has to attach a satisfyingness to the desired behavior, adequate to strengthen the connection. When the person does the suggested act he should be satisfied thereby, at least to the extent of regarding the act as fit and proper in the premises. In the case of the interest in A, for example, the suggestion that causes him to like it may well be supplemented by suggestions causing him to be proud rather than ashamed when he does like it.

These principles may be illustrated by an experiment in changing the likes and dislikes of adults by suggestion. Certain persons were instructed as follows:

"You will receive sheets containing twenty sets each consisting of four couplets, mostly by famous poets. Read the four couplets of set 1. Mark the couplet you think is the best 1, and the one you think is next best 2. If you think you know who was the author of any couplet, write his name in the margin. Do the same for set 2, set 3, set 4, etc."

A day later these persons were instructed as follows:

"You will receive four sheets containing twenty sets each consisting of four couplets mostly written in haste in an experiment in psychology by students relatively devoid of literary gifts, as you will realize when you read them. Read the four couplets of set 1 and mark the couplet which you think is the worst 4. Mark the couplet which you think is next to the worst, 3."

¹ The use of post-hypnotic suggestion is the clearest case of this. Hypnosis is the device. The difficulty is to make sure that the connection will influence the ordinary course of the person's life. He may, when the situation in question arises, relapse momentarily into a special state like that of the hypnotic trance, obey the suggestions, and then eject the incident from his normal organization of habits.

There were two different sets of the couplets "mostly by famous authors" and two different sets of the couplets "mostly written by students in an experiment." Call these Good A, Good B, Bad A, and Bad B. Each set of four couplets in Good A and Good B consisted of three by famous writers and one mediocre couplet. Each set of four couplets in Bad A and Bad B consisted of three by the students and one mediocre couplet. The same mediocre couplets were used in Good A as in Bad B, and in Bad A as in Good B. Half of the persons were given Good A and Bad A to read and rate; half of them were given Good B and Bad B to read and rate. So the same mediocre or "neutral" couplets were read with different instructions by the two groups of persons.

Two days later all the persons were given the mediocre or neutral couplets alone and instructed as follows:

"Write LL before each couplet that you like especially, L before each couplet that you like, D before each couplet that you dislike, and DD before each couplet that you dislike especially. You are not now judging these couplets as to literary excellence, but simply expressing your personal feeling about each."

We can consequently observe the influence of association with good couplets and the instructions which suggested high quality by famous authorship and by requiring a choice of the best and next best, in contrast with the influence of association with bad couplets and the instructions which suggested low quality by incompetent authorship and appeal to the subjects' own judgment and by requiring a choice of the worst and next to worst.

In this experiment care is taken, not only to predispose the persons to like the neutral if it is read along with "goods" and to dislike it if it is read along with "bads," but also to feel that the likes in the one case and the dislikes in the other acquired in the process of reading and rating are fit, proper, and commendable. A person who

during the reading liked a mediocre couplet better than two or more of the "goods" and so rated it 1 or 2, not only had the liking and used it, but had no reason to question it. If, in the test two days later, he liked a certain mediocre couplet in accordance with suggestion, he often had a defense for his liking in his memory that it was among the "goods."

The results of this experiment and of experiments identical, save that the time intervals were $\frac{1}{2}$ hour, 24 hours, and 48 hours, were uniformly to cause the same couplet to be liked more after the positive suggestions and disliked more after the negative suggestions.¹

There is no need to invoke any special force, suggestion, to explain these results. The arrangement of the experiment stimulates the person to like (or dislike) some or all of the neutral couplets when they are presented in the sets of four, or at least to consider them as estimable (or the opposite). These likings and dislikings or attitudes of esteem and disfavor act in the test later to cause likings or dislikings. What our "suggestions" do is to cause certain connections to occur and to reward them. The real forces are occurrence and satisfaction (in more customary terms, repetition and reward). "Suggestion" only brings them into play. In my opinion that is precisely what successful suggestions do ordinarily accomplish, and is the way in which suggestions should be used in modifying adult interests.

IMITATION

The extent to which, and the causation by which, the attitudes and interests of an adult tend to become like those of other human beings who influence him, has been made the subject of few scientific observations and almost no experiments. Also the general facts about imitation are ill-known and in dispute. A scholarly and critical

¹The experiments are described in Chapter XII of *The Psychology of Wants, Interests and Attitudes*.

account of the whole matter is needed as a guide to practice. Lacking it we can only note certain facts and principles and expose certain errors.

1. There is no general tendency for every human being to duplicate the acts, ideas, interests, wants, emotions, etc., of every other human being with whom he is in social contact. There is no general tendency for him to do so in respect of such other human beings as he approves and admires. There is no general tendency to do either at any one age.

2. There are certain special tendencies, as to stare at that at which one's fellow men are staring, to run toward the spot where they are congregating, to run after the object which they pursue, to run from the thing or place whence they are scattering, which, by inherited nature or training, or both, exert a pressure toward similar action within a group. This similarity of action often causes similarity in attitude. A person who runs down the street with others staring at two fighting boys, or overturned automobiles, is likely to become curious. One running away among a terrified crowd is likely to become afraid.

3. In certain situations a person feels more comfortable when doing what the great majority of his group are doing than when doing something different.

4. Tendencies to do what others are doing and to feel comfort in doing so are stronger if the others in question are persons whom one admires and toward whom one has the attitude of submission. So imitation operates from little children toward their parents and older children, from servants toward masters, from the poor toward the rich, etc., more than in the reverse directions.

5. The behavior of others, especially those above one on a mastery-submission scale, may operate apart from their actual presence. The memory that such and such persons do or feel so and so may make a certain similar act or attitude attractive, so that one is induced to do it, and

may make one satisfied with having done it, and so strengthen the tendency for the future. The fact that an esteemed person does so and so is usually strong evidence that one will not be ridiculed or scorned for doing it. Much imitation is not a direct perceptual contagion but a favoritism toward courses of life which come well recommended and leave one contented when one follows them.

6. The forces noted in 2, 3, 4, and 5 are, however, so limited in their action that the wants, attitudes, and interests of even a relatively compact community, such as an American small town, are by no means assimilated to uniformity. Each profession or trade is permitted, even expected, to have its special interests. The Protestants and Catholics may imitate different persons and ideals. The young toughs can be happy with their own idols, which are not those of the young business men, which again are not those of the young intellectual, supposing the town to have any. If not in the neighborhood, at least in the wider world of his imagination and hopes, a person can find leaders and comrades whose expected praise counteracts the scorn of the village. He can be contented in his eccentricities which are validated by the examples and praise of his chosen world.

7. Doubtless if it becomes the normal expected manly or unmanly thing to go to school at forty, interest in adult learning will be easier to arouse in adults generally. If it becomes as creditable to learn foreign languages as to earn a living, or bear and rear children, or observe religious ceremonies, the interest in learning them will probably be more widespread.

In general, there is some probability that the interest shown by the teacher and by those in the class whose conduct has a prestige value will influence others to have the interest in question. The others may be stimulated to feel it or act as if they felt it, and are likely, if they do so, to be comfortable in the confidence that they are doing

what is right and proper and estimable. If the interest has these satisfactory consequences it will tend to be maintained and strengthened. But we must not expect too much from imitation. It is fairly easy to induce people in general to laugh or yell or sing or tease or hate or change from one form of display to another by the example of those whom they admire. But to induce them to like to learn a foreign language or a science, or to be interested in the industrial developments in China and Japan, or in the evidence for and against the quantity theory of money, is very hard. The force of imitation can overcome only a moderate amount of resistance. Those in whom the example of the admired fails to arouse the interest, or in whom the interest does occur for a while but is given up because it fails to produce satisfactions adequate to counterbalance annoyances, will find excuses for their lack or abandonment.

"CONDITIONING": ASSOCIATIVE SHIFTING

The inappropriate word *conditioning* has come into use as a name for two very different, but often confused, ways of modifying behavior. The first is the connection of a reflex response (such as the flow of saliva, or the contraction of the pupil of the eye, or the closure of the eyelids, or the jerk of the leg when the knee is tapped) to a situation other than that to which it is attached by man's original inherited nature. Dogs thus learn under certain conditions to discharge saliva when a bell rings or a certain object appears. The phenomena of the so-called conditional reflex are of great interest and importance, but we need not consider them here. The techniques by which such are established are not suitable for use in any ordinary form of adult education, nor would the interests which teachers of adults wish to establish probably be amenable to the methods in question.

The second way of modifying behavior to which conditioning sometimes refers is better called by its earlier name, associative shifting. It is the way by which dogs are taught to stand up when we say "Beg," horses to stop when we say "Whoa," cats to come when we call "Kitty, Kitty," and children to know the meanings of words. A certain response that is connected with one part of a total situation becomes connected with the total situation and then with that situation minus the part which was at the outset essential. If S1 calls forth the response R, then by judicious management we may cause S1 + S2 to call forth R. By further judicious management, we may cause S2 alone to call forth R. The response has been shifted so that either S1 or S2 will evoke it. The judicious management consists in adding S2 to S1 and subtracting S1 from S1 + S2 so gradually that the connection leading to R will not be lost, and in rewarding the connection as it shifts from S1 to S1 + S2 and from S1 + S2 to S2 alone with the same end in view.¹

The method of associative shifting is invaluable in the acquisition of many of the attitudes and interests which are required for civilized, humane, competent, and moral lives.

¹ The graduated adding and subtracting may consist in using a small amount each time or in using the entire amount more and more often, or in various combinations. Thus in shifting S1 + S2 → R to S2 → R by gradually subtracting S1, either one of the two procedures below could be used. 1, 2, 3, 4, etc., refer to successive days or other periods of training.

A		B	
1	Nine tenths of S1 + S2	1	S1 + S2 nine times out of 10
2	Eight " "	2	S2 alone once
3	Seven " "	3	" twice
4	Six " "	4	" three times
5	Five " "	5	" four "
6	Four " "	6	" five "
7	Three " "	7	" six "
8	Two " "	8	" seven "
9	One tenth " "	9	" eight "
10	S2 alone	10	" nine "
			S2 alone always

It is applicable in adult education in such cases as the development of an interest in a new occupation by shift from the interest in obtaining a job, or the development of an interest in the principles of economics and government by shift from the interest in some crisis in business. We shall consider it further after presenting the facts concerning the other important method of learning, by selection from a variety of responses.

SELECTION BY REWARDS, i.e. SATISFYING AFTER-EFFECTS

To the same situation, S, a variety of responses, R1, R2, R3, R4, etc., may be connected according to variations in the accompaniments of S, or in the condition of the person.

By proper means, especially by the provision of satisfying after-effects, the connection leading from S to, say, R3 may be strengthened relatively to the others until it becomes the person's habitual response to S.¹ So, for example, a child learns to put food from a spoon into his mouth rather than on his nose, chin, cheeks, or bib. So the ball-player learns to throw the ball to the mark, and not too high or too low or too far to the left or the right.

We have made experiments to discover whether the process of selection by satisfying after-effects applies to interests and attitudes as well as to knowledges and skills. For example, will a person who responds to the sight of a snake sometimes by fear, sometimes by neglect and sometimes by handling or other curious examination, respond increasingly in the last way if his handling the snake produces pleasant thrills of interest, approval from

¹ A complete description of the facts covered by this statement would lead to an elaborate discussion of external situations, mental sets, the variability of the brain's actions, the nature of the connections whereby one state of affairs causes the sequent state in the human brain, and even to metaphysical arguments. All this may be spared the reader, who may be confident that no conclusions will be drawn here that would not hold good for an adequate critical statement.

by-standers, an inner sense of pride and mastery, or other satisfying after-effects? Will a person who is rewarded by desired praise whenever he feels and shows liking for a certain study tend to feel and show liking for it oftener and dislike or indifference less often than before?

The answer is *Yes*. Desires, emotions, attitudes and interests seem to be modified by their after-effects in the same way that traits of intellect and skill are. Mental connections are strengthened by repetition and reward, i.e., by occurring and by satisfying the person in whom they occur, as truly when the response is one of feeling or attitude as when it is one of thought or action.

We have, for example, arranged to have certain likes and dislikes satisfying to the person because he finds them to agree with those of people whose tastes and interests he approves. These rewarded attitudes do become stronger thereby. We have arranged to have persons contented when they like landscapes and dislike pictures of persons, and find a demonstrable strengthening of their preference for the former. More usefully, we have arranged to have persons contented when they like such pictures as people of good taste do like, and find a demonstrable increase in their enjoyment of such.¹ We also show there that selection operates thus on the likes and dislikes of adults as well as on those of immature individuals.

A fundamental principle for the control of interests is then: "To attach interest to any situation (any object, study, activity, etc.), cause the person in question to have the interest in response to the situation, and reward him therefor. Cause the interest to occur in that connection and reward its occurrence."

Either alone or in cooperation with associative shifting, strengthening by after-effects account for the great bulk

¹ The evidence is presented in the *Psychology of Wants, Interests and Attitudes*, Chapter 14 and Appendix VII.

of the modifications made in human behavior in general, and probably of the modifications made in interests and attitudes in particular. Frequency of occurrence or repetition is useful chiefly as a means of permitting after-effects to operate. Suggestion and imitation are useful chiefly as means of either arousing and rewarding a certain behavior, or of arousing it for some other force to reward, or of rewarding behavior otherwise aroused.

The general principle of modifiability and control are the same for all features of human nature. Interests and everything else are strengthened by causing them to occur, and by rewarding them.

Sometimes the situation in question does not by itself ever produce interest or but very rarely. We must then proceed indirectly to shift interest to it, before we can reward the person for having interest in it. For example, in the case of most persons, if we waited until quadratic equations happened to arouse interest we should have few or no occurrences to reward per hour of time spent. It is better to use associative shifting to cause or hasten the occurrence of interest in connection with quadratic equations.

Also the practical difficulty of attaching a reward to an interest, attitude, etc., is often much greater than that of attaching a reward to the presence of an idea or the performance of an act. The reward may attach itself to something else in its neighborhood which is more definite, available and obtrusive. For example, if we are trying to teach a man to enjoy the artistic qualities of Japanese prints and proceed by rewarding him (say, with praise) on the occasions when he seems to do so, we may find at the end that we have taught him only to *know* which are good, not to enjoy them; or only to *say* that he likes them, not to do so really; or only to have a mildly pleasant acquiescence in esteeming them instead of a vivid personal delight. The behavior which we rewarded included other

features besides the pure enjoyment, and our rewards got attached to these rather than to it.

This difficulty is unavoidable, and the control of interests, attitudes, desires, etc., is in so far forth harder than the control of ideas and acts.

SELECTION BY PUNISHMENT, i.e. ANNOYING AFTER-EFFECTS

The theory of the use of annoying consequences to diminish undesirable behavior in general and undesirable interests in particular will be presented later (in Chapter VI). The facts there presented make it highly probable that punishing an interest will be useful in adult education only where it is the equivalent of rewarding an opposite or alternative interest, or leads indirectly to an opportunity to reward some desirable interest. In and of itself the occurrence of an undesirable interest is likely to do more harm by occurring than the teacher can remedy by punishing it.

THE USE OF REWARDS IN CONNECTION WITH ASSOCIATIVE SHIFTS

The way to proceed in teaching oneself or others to have an interest in certain facts, topics, activities, processes, etc., is to use direct selective strengthening by rewards alone where that is possible, and in connection with associative shifting where selection alone is not possible. Consider the interest in learning to read a foreign language, say French, as a first illustration. Suppose that S, the work of learning the meanings of French words, connects sometimes with R1 (mild liking), sometimes with R2 (mild dislike), sometimes with R3 (indifference) and sometimes with R4 (intense liking). If $S \rightarrow R4$ brings self-approval, praise from others, happy thrills or peaceful contentment, whereas $S \rightarrow R3$ and $S \rightarrow R2$ produce dissatisfaction, shame and irritation, $S \rightarrow R4$ will be strength-

ened and become more and more the person's habitual attitude.

Suppose that learning the meaning of the French words never arouses liking, but only mild dislike (R2), moderate dislike (R5) and intense dislike (R6). Selection cannot give us the attitude we wish to have because the varied reactions do not include that attitude. We must have recourse to associative shifting. Something to which the learner does respond by liking must be put with the French, and the interest obtained for the composite then be shifted over to the French by the procedures used in associative shifting. Thus we might send a person to France so that the interest in the people, the shops, the scenery, etc., may diffuse an interest over the word-meaning facts. This interest in learning the meanings of French words in France might then be retained when the person was brought back from France, but supplied with a large collection of pictures, advertisements, signs, notices, menus, etc.; in case the person's work in learning and retaining meanings was made satisfying to him. It might still be retained while this collection of aids was gradually withdrawn, until finally the person would welcome the learning of French words in and for itself. When the response for $S1 + S2$ is being shifted to $S2$ alone, the consequences of the behavior should be kept satisfying. Unless the interest in $S2$ brings satisfaction there is great danger of reversion to the old lack of interest. The provision of satisfying after-effects for the behavior one seeks to establish is important in both sorts of learning. It is the essence of learning by selection from varied reactions, and is a main support of much learning by associative shifting.

In many cases one and the same means may be used to shed interest over or diffuse interest into the thing to be learned, and to reward occurrences of that interest. Suppose, for example, that a person is to learn typing and

that the typing (S) never arouses any liking on any occasion, but only mild dislike (R2), stronger dislike (R5), dislike + headaches (R6), and dislike plus disgust and nausea (R7). Selection cannot give us the attitude we wish to have because the varied reactions or multiple responses to typing do not include it. We must have recourse to associative shifting. Something to which the learner responds by liking must be put with the typing and the liking thus obtained must be shifted over to the typing. Let us assume that the learner, John Doe, likes outside praise and self-approval. He is taught to regard each practice period of typing as a triumph of his will, ambition, deeper self, or whatever you choose to call it, over a superficial dislike. He receives admiration and feels himself a conqueror as he taps out the lesson. The lessons, no longer mere typing, but typing plus expression of John Doe's manhood and a triumph of his powers, become interesting. The outside praise and inner self-approval which make the work interesting also reward the work and the new attitude toward it. The golden rules for the cultivation of an interest in A are: Connect that interest with A and reward the connection. Make wise use of contiguity, suggestion, imitation or other causes to connect the interest with A. If the interest cannot be connected with A directly, connect it with A + X, and shift from A + X to A, rewarding the connection with A whenever it occurs.

CHAPTER IV

THE CONTROL OF ADULT INTERESTS (*continued*)

Two important possibilities for controlling interests have not yet been discussed. One is that the mere repetition of an unpleasant activity makes it pleasant or at least neutral. The other is that by acting as persons would act who had an interest, one acquires it.

REDUCING DISLIKE BY REPETITION

General observation furnishes many instances where repetition of an unpleasant activity results in greater tolerance or even liking for it. How far is this due to a fundamental tendency for repetition by a person to change his attitude, and how far to other factors, such as his increased ability and sense of mastery, or changes in the activity itself? We need to know just what the sheer repetition may be relied on to do, and what may occur when certain other forces are added to it.

Consider three alternative doctrines concerning sheer repetition:

1. Repeating any activity brings the feelings or attitude accompanying it toward neutrality, whether from pleasantness or liking or from unpleasantness or dislike.
2. Repeating any activity does so only for unpleasantness or dislike.
3. Repeating any activity brings unpleasantness or dislike accompanying the activity toward neutrality, *and past it to pleasantness or liking.*

The first is the most reasonable and the last is the least reasonable, on general grounds. The evidence adduced for the potency of sheer repetition however usually favors the last most and the first least. For example, there is abundant evidence that persons led by hunger to eat food that they dislike may come to like it but little or none that persons by daily eating of fruits, nuts and sweets lose their liking for these.

We have carried out experiments in which twenty-eight adults, two times a day for seven days swallowed cod-liver oil, handled a snake, stood on tiptoe on one foot, and extemporized poetry before an audience.¹ They reported the degree of dislike on each occasion as accurately as they could. The results are reported in Chapter XVI of *The Psychology of Wants, Interests and Attitudes*. These results and various other facts show that the influence of the repetition of an activity upon the accompanying attitude is complex and varied, and that, in adults at least, a general, direct and inevitable diminution of dislike by the mere repetition in and of itself is a very minor feature of the influence. If the reader will review his own experience in respect of repetitions of disliked activities, he will find some that came to be liked and some that became more tolerable, but also some that became more intolerable, and some that showed no appreciable change.

The most probable explanation of the facts is that the repetition of an activity changes the accompanying attitude only when it changes (1) the activity itself, or (2) its consequences, or (3) the person's expectation from it. The third is, of course, changed chiefly *via* the first and second. Consequently, the wisest procedure in practice is not to rely on repetition in and of itself to alleviate dislike, but to make sure, by repetition or otherwise, that the

¹ Only twenty-seven handled the snake, one person preferring to pay a fine of 15 to 30 cents on each occasion (the penalty for failure) rather than do so.

activity changes toward greater attractiveness, and has favorable consequences, and that dislikes due to false expectations are cured.

Changes in the activity itself may be illustrated by the decrease in general muscular tension as in continuous practice in typewriting or the easier maintenance of the tiptoe position by better balancing and less over-action of opposed muscles. Perhaps learning to typewrite could be made more enjoyable from the very start if the learners could be taught to avoid useless over-tension. In a later section of this chapter we shall consider the general possibilities of increasing interest by changing the activities or situations without diminishing their educational values for adults.

Changes in the after-effects or consequences of the activity may be illustrated by learning to drive a car, in which the satisfactions of success and mastery replace the worry of incompetence and the annoyance of failure, or by the reduction of dislike due to fear in the case of an activity repeatedly found to be harmless.

Changes in expectations from the activity may be illustrated by the handling of snakes, thought to be slimy but found to be dry, or the improvising of poetry in public before an experimental group, thought to be a cause of stage-fright and shame, but found, under the conditions of the experiment, to be relatively humdrum and devoid of either glory or shame. In the case of adults who have never tried learning a certain thing, or anything like it, a few experiences of it may alter greatly attitudes toward it which had been caused by entirely irrelevant occurrences. Such cases are perhaps not so rare among adults as we think. In spite of the variety of experience in present-day schools, homes, and work, a person may retain till thirty prejudices about how he would like or dislike certain activities which experience will show to have been very misleading.

Our illustrations have all been of changes toward more favorable attitudes. It is such changes that adult education is chiefly concerned with when it urges pupils to try to learn so and so even though it appears uninteresting, and is so, in early trials. But the fact that repetition has no mystical intrinsic power over likes and dislikes, but operates by changing the activity, its consequences, or one's expectations from it, implies that it may change attitudes unfavorably. When novelty wears off interest may wane. When the consequences of one's learning include evidence of one's inferiority to others, dislike may accrue. When one finds that the new physics is not chiefly a series of pictures of dashing electrons, ingenious and beautiful imaginations of the constitution of atoms, gratifying reflections on the nature of the God who thought out such a universe, and the like, as one expected from popular books, one may falter. The more he knows of the new physics, the less he may like it. The Einstein equations, if he ever gets to them, may be utterly unattractive. Repetition is a two-edged sword.

ATTAINING INTERESTS BY APPROPRIATE ACTION

The doctrine that a person who acts as if he had a certain interest will thereby acquire it is a part or corollary of the doctrine that emotions and attitudes in general are produced, or at least favored, by the behavior which accompanies and, as we say, expresses them. Breathe deeply, slowly and regularly and you will feel calmer; mother a baby and you will love it; fasten your gaze upon the teacher, say his words to yourself as he speaks them, and you will be more attentive.

Practices recommended by the doctrine are helpful regardless of whether the behavior does produce the emotion, for the behavior is in some cases what is chiefly wanted, the emotion being sought chiefly because it will

"express itself" in that behavior. Who cares much how attentive he *feels*, if his mind is fully devoted to and absorbed by the work! In other cases the behavior alone is nearly as good to have as the emotion plus the behavior, the difference being a relatively small matter of personal comfort. So if one acts courageously in all external respects, he will be a hero and the world will suffer naught, though he felt a miserable terror. That is a small thing for him to suffer compared with shame, disgrace, and the fear of acting like a coward the next time.

The practices recommended by the doctrine are useful for another reason. Even if there is little surety that acting as if one felt an emotion will evoke it, any other means of evoking it in the particular circumstances may have far less probability of doing so. Emotions, wants, and interests are not readily available or summonable by any other means. A man can summon and dismiss certain ideas easily, and certain acts fairly easily, when and as he will, but fear, courage, like, dislike, pride, shame and the like are not at his beck and call. Roughly speaking, he has two means to control their appearance; he may act as if the emotion were there in the way we are discussing, or he may cause some idea or act to occur which in his past experience has gained power to arouse the emotion.¹

The second means may be so likely to fail that the first is preferable. Or both may be used together, the person acting as if he felt the desired emotion and summoning the most promising memories, slogans, reasons and suggestions that are in his repertory.

It is desirable to have more than a conviction that behaving as if one liked a certain activity is worth trying as a means of facilitating that liking. It would presumably

¹ So a child may gain courage by thinking "I am a boy scout" or "Anything is better than to be a coward." So an adult may gain interest in study by thinking "I can learn this if I try."

help adult students and their teachers to know more exactly what can and what cannot be expected from such behavior. The following are parts of or steps toward such knowledge: 1. A person who dislikes a lesson, say in music, cannot, by act of will, behave toward it just as he would if he liked it. He may listen and obey all orders promptly and energetically with smiles, but certain inner welcoming and zeal cannot be commanded. His behavior cannot on any theory be expected to produce a perfectly genuine liking directly and inevitably. The most that can be expected of it is that it will produce by association what has accompanied or followed it in past experience. 2. If the James-Lange theory¹ holds true of such likes, dislikes and interests as operate in adult learning, there is a fair probability that the behavior will produce liking. The probability will vary according to the fraction of the "bodily expression" of liking that the person can enact, and according to the frequency and satisfyingness of the past connections of this fraction with liking. 3. Even if the bodily expressions of like, dislike, interest and neglect are sequents and results of the feelings, not antecedents

¹ The James-Lange theory is that certain emotions or features of emotions are caused by the bodily attitudes executed by the situations. Our natural way of thinking about these coarser emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression.

"My theory, on the contrary, is that *bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion.* Common-sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually *feel* afraid or angry." (W. James, *Principles of Psychology*, Vol. II, p. 449.)

and causes, a certain amount of benefit may be expected from the behavior. For liking and interest usually come, not in single pulses like startle, but in fairly long spells, wherein feeling runs along with bodily expression, following as well as preceding it. Whichever is horse and which is cart, either may be expected to have some power to evoke the other — with, however, one important proviso, that the feeling “belongs” with the bodily expression as its outcome.

On the whole a person may be hopeful that honest efforts to act as if he had an interest in a certain sort of learning will foster that interest to some extent, and may be confident that, even if they do not increase interest, they will facilitate learning.

CHANGING INTERESTS BY CHANGING THE NATURE OF THE SITUATION OR ACTIVITY

Interests and attitudes toward what is called the same thing — studying algebra, studying the French language, studying the Chinese people, or what not — often change because the thing itself becomes different. Algebra as really generalized arithmetic in which the operations are carried out with literal numbers and algebra as a device for conveniently solving numerical problems by calling the to-be-found number x , appeal to different interests. The person to whom the Chinese people means only laundrymen and domestic servants in the United States naturally changes his attitude after a visit to the Chinese room of a museum.

Interest or liking may be increased by freeing the activity from certain repellant features which are of little or no value to the learner. If the response to $S_1 + S_2 + S_3$ is dislike, whereas the response to $S_1 + S_2$ is liking, and if S_3 is valueless, we obviously make a great pedagogical improvement by eliminating S_3 . For example, consider

the use of the words listed below in books on science for beginners, who have had schooling only through grade 7 or less and have read little since then. Such a person might like science, but not like a book full of such words as these. He surely would have an increased probability of interest if these words were replaced by easier equivalents.

WORDS FOUND IN TWO ELEMENTARY BOOKS ON SCIENCE

<i>Book I</i>		<i>Book II</i>
aboriginal	alternative	aborigines
abortive	amatory	acumen
accompanist	amenable	allegation
acrid	analogue	almagest
adaptiveness	aphorism	antipodes
addicted	appreciable	antiquarian
adduce	apprise	anthropology
adroitness	argus	archive
affirmation		ascendancy
aggregation		astrolabe
alpenstock		authenticity

Interest may obviously be increased by the right sort of addition to the activity. Thus in teaching better methods of agriculture, it has been found very desirable to have at least one farmer in the community actually use the methods. No matter how impressive and convincing the teacher's presentation was, the chance to see a neighbor making the experiment added interest as well as conviction.

Interest may be increased by modifying the emphasis put upon various features of the activity. If, in $S_1 + S_2$, S_2 is more interesting we may expect gain by reversing the emphasis to $S_2 + S_1$. Moreover changes in emphasis may operate more subtly than this. S_1 , which was uninteresting when predominant, may itself become more interesting when subordinated. The adaptation of subjects of study to the interests of children abounds in rearrangements of emphasis, some of them very ingenious and profitable.

In treatments for adults, the reader may compare H. G. Wells' *Outline of History* and Hendrik Willem Van Loon's *Geography* with conventional treatments.¹ To take a more extreme illustration, consider the effect, in teaching a foreign language, of greatly increasing the emphasis on knowledge of vocabulary at the expense of knowledge of genders, declensions, and irregular forms. The result would be a much more rapid acquisition of ability (up to a certain point) to understand the printed and spoken language, and of the ability to speak and write it intelligibly but ungrammatically. Would the gain in interest outweigh the practice in error?²

The possibilities of altering interests in what is in name the same situation or activity by changing its nature are, in principle, the same for adults as for children. And there seem to be no important differences in their operation. If we know the interests a person has and can adapt the subjects of instruction to these interests without loss in other respects, we have a gain in interest at no cost.

CHANGING INTERESTS BY CHANGING THE MENTAL SET OF THE LEARNER

Some interests are deep-rooted in a person's nature and persist in spite of notable changes in his experience and education. So a man may crave the inner approval of his deeper self, may want to think well of himself, through many changes in fortune and status. As student, athlete, lover, husband, father, productive worker, neighbor, re-

¹ The general merit of these changes in emphasis may be questioned. That does not now concern us, but only the certainty of a change in emphasis and the probability that it was advantageous for adult interest.

² The speech and writing would not be exactly practice in error in the strict sense, though it would be extremely bad from the point of view of a gentleman and a scholar (not to say a grammarian). If the learning paid absolutely no heed to French genders saying *le* or *la* at random, he would not be practicing error so much as practicing neglect. Since he would have said *le* and *la* equally often for any one word he would perhaps be as ready to learn the right genders after a year of such practice as before.

former, and servant of God, he may have very different interests. But through all he may persistently care about being satisfied with what he is or thinks himself to be. Such interests are a part of the permanent nature of the person. Some interests are almost entirely adopted and abandoned at the instigation of external circumstances. So whether a person is interested in learning the streets of Detroit or the streets of Chicago depends almost wholly on where he resides or works.

All interests, from those most firmly fixed in the person's nature to those most sensitive to external events, are to some extent determined by the mental set of the person at the time. This mental set is the resultant of his whole nature and all his past history including his interests, as aroused to action by the situations. The long time work of education in changing a man's nature shows its results in the mental sets he has toward this, that, and the other situation of life. The short time work of education often consists in changing him so as to produce a certain set or sets in the near future. Both long time and short time changes result in changed interests, but the comments here will concern especially the latter.

Such changes in the mental set may cause interests to develop almost as if by magic. The assumption of a new job or emigration to a new country are obvious illustrations. A teacher who inserts hope and expectation of success in place of fear and expectation of failure in a pupil's set toward learning A may thereby seem to work a miracle in his interest in learning A. A teacher who arouses in a class the attitude that it is *their* class, of which they are partisans as of a church, club, political party or gang, in which they have their being, their pride and the expression of their personalities, may count on an increased interest in learning anything in that class.¹ The

¹ Whether such narrow class patriotism is on the whole desirable may of course be questioned.

influence of suggestion upon interests often operates via a change in the mental set rather than directly on the interest in question.

INCREASING INTEREST BY INCREASING ABILITY

If a person is measured or ranked in respect of his interests in A, B, C, etc., and also his abilities at A, B, C, etc., a positive correlation (that is, a similarity of the two rankings, above what chance would give) will be found. Except for a few eccentric individuals, persons will on the whole like most those activities in which they do best. The average degree of correlation will be substantial. There would be some disagreement as to how far the similarity between what a person likes most and what he can do best is due to ability causing interest, and how far it is due to interest causing attention, practice, satisfaction at success, and so increased ability. Everybody would allow some potency to the former and probably everybody who has studied the matter at first hand would ascribe over half of the resemblance to it.

If a person tends to like most that which he can do best, because the relatively greater ability produces greater interest, it may be expected that an increase in the absolute amount of ability will produce an increase in the absolute amount of interest. This is likely on other grounds; for increased ability usually results in more satisfaction to the cravings for achievement, mastery, the approval of others and the approval of one's self. It also results in less thwarting or frustration. These satisfactions obtained in connection with the subject or activity learned diffuse interest over or through it. There have not, to my knowledge, been any direct measurements of changes in interest produced by increases in ability. But certain observations indicate that they would be substantial. For example, persons who have engaged in learning

series of nonsense syllables, like *zel don ril pash ven yeb tum*, report that as they acquire greater and greater facility this useless and boresome toil becomes fairly interesting. The observations of teachers have to be discounted because the persons who continue a study long are likely to be those who had especial ability and interest at the start. Comparison of their interest with that of beginners in general is thus fallacious. But even after a liberal discount, most teachers would still feel justified in encouraging students in the expectation that progress in learning will bring increased interest. And they probably would be justified on the average. Other things being equal, interest will increase as learning increases and adds ability.

CHAPTER V

LEARNING WHAT IS INTRINSICALLY UNINTERESTING

FOR any given person things to be learned may be arranged in a scale running from those which are intrinsically so interesting that the person's mind would require no inducement to engage in them beyond what the learning itself offered to those in which he would engage only by reason of some stirring motive outside the learning, such as to preserve his self-respect, or please his family, or secure some great economic or social advantage. Near one extreme for most adults would be learning about the appearance of the world by a tour around it; near the other would be learning the names and birth dates of all the inhabitants of some European town in 1650. The title of this chapter should, in strictness, be Learning Without Intrinsic Interest. Learning without interest of some sort does not occur to any appreciable degree. But the popular and even the technical uses of "not interesting," "without interest" and the like in place of "not intrinsically interesting," "without intrinsic interest" and the like are so widespread that the briefer and more convenient title seems preferable. This scale from intrinsic to extrinsic might also be thought of as a scale running from activities in which what theologians used to call the "natural" man is interested to those which require social pressure.

In the education of the young, it used to be assumed that favoring the intrinsically interesting was dangerous, and that children should be moved to learn by extrinsic and remote interests in doing their duty, obeying their

elders, getting on in the world, and the like, which meant in reality interests in obtaining certain benefits and avoiding certain injuries which the ruling powers connected with dutifulness and remissness, obedience and disobedience, etc. Traces of this remain, but the approved practice now is to favor the other end of the scale so far as is consistent with preparation for a good and useful life.

Adult education, developing recently, has accepted rather wholeheartedly the later view. Since the learning is at present voluntary, and since there are few promotions, degrees, diplomas, or other benefits conferred upon students beyond the learning itself, it would be difficult to operate classes where pupils learned what they did not want to learn. But, regardless of this difficulty, the general temper of adult education is to satisfy felt needs rather than ideals inspired from above, and to supply a student demand rather than to transmit traditional forms of knowledge and skill supposed to have disciplinary or cultural values which are so remote from the student's interests that he must be forced or bribed to learn.

There is, of course, not perfect intrinsicness in the interests; the adult wants advancement in his vocation or repute among her neighbors. But the vocation or avocation is self-chosen, and interest in its techniques is much nearer to the intrinsic end of the scale than to the end where one learns purely for duty or money or esteem. Adult education, except for students seeking diplomas from evening high schools or degrees from colleges and universities, is busy for the most part in teaching men and women things which they want to learn. It is for the most part free from the burden of teaching things which not one person in five of the class would try to learn except for very ulterior motives.

In spite of this, the problem of learning without interest exists in adult education. There is a large body of intrinsically uninteresting fact or skill interspersed in the

most liked subjects and activities. Indeed there is even in most games and sports. There is again and again the question of whether to try by one stratagem or another to infuse the dull stretches of learning with an interest of their own or to trust the general purpose of the learner to carry him through them. Some would urge teachers always to do their utmost to abolish or shorten them. Others would argue that in many cases the maximum of learning per unit of time and effort of the learner will be obtained by a frank acceptance of much dull work as necessary and profitable.

For the right answers to all such questions we need knowledge of how much harder it is to learn the uninteresting than the interesting. In the absence of scientific knowledge very divergent beliefs have gained credence, ranging from confidence that a schoolboy who tried could learn five verbs that take the ablative in the same time that he would need to learn the names of five foot-ball stars to confidence that the uninteresting can never be really absorbed by the mind, and, if forced upon it by repetition, will be soon discarded.

We have therefore carried out extensive experiments in which adults tried to learn things of varying interest and value.¹ They studied the following facts, topics, and skills:

- 1 (a) the birth years of celebrities in art, letters, etc., *versus*
(b) the birth years of nonentities (tailors, cobblers, etc.)
- 2 (a) the real birth years of celebrities *versus*
(b) years stated to be years when they were *not* born
- 3 (a) the real meanings of rare English words *versus*
(b) words stated to be what the words *do not* mean.
- 4 (a) the reading of one's first choice among Fraser's *Golden Bough*, the Bible, and the Book of Mormon, *versus*
(b) the reading of one's third choice amongst them.

¹ Most of the subjects had had college education or its equivalent. For persons of less ability and training in learning and with less intellectual interests, the material used should be different.

- 5 (a) listening to brief true accounts of the life and work of eminent men *versus*
 - (b) listening to similar accounts which are false and are stated to be false in every particular.
- 6 (a) writing with the left hand with eyes open *versus*
 - (b) writing with the left hand with eyes closed.
- 7 (a) typewriting of the ordinary sort *versus*
 - (b) typewriting in which each word was spelled backward.
(*The man had* being typed as *ehT nam dah.*)

In most of the experiments the subjects were paid a fixed amount per hour plus bonuses which depended upon the amount that they learned. They were then in much the same condition as persons learning interesting and uninteresting matter all counting toward a degree, diploma, promotion or other extrinsic reward.

Some of the experiments occurred in the regular work periods of college classes and the subjects were paid nothing beyond their normal credit for class attendance. They were pledged to try equally hard to learn both sorts of facts, so that a sense of duty and the desire to make a good score were their motives in the dull or useless learning. These learners were in much the same condition as persons learning interesting and uninteresting matter to retain self-respect and attain social prestige.

The results of these experiments present a somewhat confused picture, but two facts are sure. (a) Lack of intrinsic interest is a handicap. The learner is strongly tempted not to try as hard to learn the fact or skill in question; and, if he forces himself to do so, he still does not learn as well. (b) The handicap is small. Adults can learn wrong meanings of words, wrong birth years of celebrities, and false biographies (all of no intrinsic interest or value whatsoever), nearly as well as true and useful facts. Let any reader of this book make up two lists, one of a hundred facts which he very much wishes to learn, the other of a hundred facts of equal length, complexity, and subtlety in which he has no intrinsic interest

at all. Let some benevolent deity or experimenter guarantee him 10 cents for each fact learned of either sort, or let him be otherwise induced to try to devote equal attention to each group for an hour. He will learn nearly as many of the second as of the first.

Samples of the facts found in our experiments are the following:

When lists of 20 celebrities and the true years of their birth and other lists of 20 celebrities and years stated to be *not* their birth years were studied for the same length of time, the number of true dates learned was about 1.1 times the number of false dates.

When lists of 20 rare English words and their true meanings and other lists of 20 rare words and false meanings were studied for the same length of time, the number of true meanings learned was about 1.8 times the number of false meanings. The true meanings probably had features other than their usefulness which made them more easily learned.

When two lists, one containing the names and birth years of 60 celebrities, the other containing the names and birth years of 60 nonentities were studied (for fifty minutes each) the average number of dates known in tests immediately thereafter was 35.8 for the celebrities and 29.4 for the nonentities. The Celebrity/Nonentity ratio was thus 1.22.

When 100,000 words from a book were read and studied for three hours by some adults who made it their first choice of three and by others who made it their third choice, the scores in a test given the next day averaged 21% higher for the first choices than for the third.

In one experiment thirty educated adults made actually higher scores on four false biographies than on four true biographies of different persons (32.0 versus 26.1). In a second experiment with twelve false and twelve true biographies, another group of forty-four educated adults

averaged $2\frac{1}{2}$ points higher for the false than for the true. It is possible that in spite of care to make the false and the true biographies equally interesting and difficult, the former may have been a little more exciting and memorable. Even a generous allowance for this would not alter the conclusion that facts actually harmful and learned only as a matter of duty, of earning a bonus, and of showing one's ability are learned nearly or quite as well as facts of intrinsic value, and equally related to duty, bonus and display of ability.

Twenty-eight educated adults practiced typing in the ordinary way during six days and also, during the same period, practiced typing in which each word was typed with its letters in the reverse order (eno for one, yadnoM for Monday, etc.). There was no evidence of more rapid learning of the regular than of the useless backward typing. The eight who learned most rapidly progressed from 140 to 190 letters per minute in ordinary typing, and from 53 to 115 in the other. The ten who learned next most rapidly progressed from 88 to 125 in regular typing, and from 35 to 65 in the other. The remaining ten progressed from 39 to 68 in regular typing, and from 22 to 39 in the other. By any reasonable method of measuring learning from different starting points, the gains of 50, 37, and 29 in ordinary typing mean no more rapid learning than the gains of 62, 30, and 17 in the other.

The superiority of learning the valuable over learning the useless ranges from zero to 75 percent in these samples. It is oftenest at about 20 percent.

The notion that the mind will not learn what is alien to its fundamental vital purposes is attractive and plausible but definitely false. In order to earn a little money or to make a good impression on the experimenter intelligent adults will learn the most trivial and useless things, such as lists of nonsense syllables, irrelevant numbers attached to words, locations on meaningless and futile

maps, tossing balls over one's head at an unseen target, and typing words backward. They have spent four hours (and probably would spend forty) at such a task without losing the ability to learn it, and without any obvious and striking diminution in the learning. In the experiments with learning by adults which we have done over a period of nine years, we have worked sometimes with such learning as might be desired or required in real life, sometimes with learning which, though not of much use to the learner, was interesting as a game and test of his powers, and sometimes with learning which no sane person would undergo except for some ulterior reward. We never failed to get learning.

As the representative results described above show, the rate of learning does not suffer greatly even when what is learned is utterly valueless to the learner. Extrinsic interests are adequate to maintain learning when intrinsic interests are not available or require an undue expense of time, labor, or skill on the part of the teacher.

On the whole, we may conclude from the experiments that when certain unpalatable mental medicines need to be taken, too much time and pains should not be taken to disguise them. If a stretch of dull learning can be learned as it is in ten hours, it will usually not be profitable to spend five hours in making it so interesting that it can be learned in seven.

If the person keenly desires to have the status or ability for which unpalatable facts or skills are required, his desire will add sufficient interest to keep his mind working and to strengthen the right thoughts and acts. If he does not have a desire to attain the status or ability strong enough to make him try, he may go without the learning or be bribed to do it by intrinsic or extrinsic attractions, according to which seems best in his particular case.

The fundamental physiology and psychology of the influence of intrinsic interests upon learning is much the

same whether the learners are children, adolescents, young adults, or old adults. But in respect of the nature of the extrinsic interests upon which the teacher may rely in these four groups, there are important differences. The adults, having had far more experience of the world and of their own natures, should know what they want and what the values to them of various sorts of knowledge, power and skill will be, much better than children. Adults are consequently more critical and less ready to study something to please the teacher, or because it is customary and others are studying it, or because the authorities say that it will be beneficial. They should be more earnest and ambitious in learning what they do think they want, and more encouraged in studying it by their better realization of what it will do for their welfare. There should be less loss from relying on extrinsic interests in adult than in juvenile education.

CHAPTER VI

INTEREST IN THE CONSTITUENT ELEMENTS OF A TOPIC OR ACTIVITY

AN interest in, or liking for, a certain subject or activity exerts its force or has its efficacy minute by minute, even second by second, in relation to the actual behavior of the person as he responds to one after another item of the subject or phase of the activity. An interest in economics, or socialism, or wood-carving, or wrestling must become or cause an interest in certain sentences, definitions, tools, acts, etc., if it is to favor learning. The general interest does not inevitably by some inner law spread itself equally over all the features of the learning. On the contrary, a strong general interest may leave some of these features neglected or disliked. It is therefore desirable for workers in adult education to consider the operation of interest upon small parts of learning, single lessons, and units of achievement within a lesson. That is the topic of this chapter.

THE CAUSATION OF INTEREST

It may be approached first by considering the question of what decides how much interest there will be in any given small unit of learning, (say to learn the meanings of rent, profit, and wages as used in economics, or the time-sequence of Bach, Beethoven, Debussy, Mozart, Wagner and five more composers, or to increase one's skill in a certain wrestling hold).

First and foremost come certain very general and dependable sources of favorable interest, such as the general sense of well-being, sensory comfort and pleasures, the enjoyment of mental activity rather than emptiness, the approval of others or the expectation of it, approval by the parts of one's self that one esteems, cherishes and regards as one's "true" self, and the feelings of competence, mastery and victory. Any activity which causes these gains interest thereby. They are rooted in the original nature of the human species. They are potent regardless of who learns and what is learned. They operate in adults as in children, though the circumstances which arouse them are often different in the two cases. They operate at low levels of ability as at high. A feeble-minded inmate of an asylum may be interested in making beds in the same way and to the same degree that a prima donna is interested in singing in operas. The pedagogy of the elementary school has made notable gains in interest by deliberately canvassing the possibilities of enlisting these deep-seated wants of human nature in the service of reading, writing, arithmetic and the like. A similar gain can probably be made in adult education.

Next in order come certain sources of interest which are highly constant and dependable for any given adult though varying widely among individuals. The reader can probably list certain such steady reliances (such perhaps as working on materials with tools, or making a collection, or arranging a miscellany into a classified order, or learning anything whatever about modern English history, or about gifted children, or about the family, or about adult education, or being in sociable and cooperating groups, or being at peace alone, or something as definite as these but unlike any of them) which are his meat and some friend's poison. Such an interest lends strong support to any piece of work which is germane to it. In so far as adult education is specialized among or

within classes, there is an opportunity for gain in interest by assigning work to individuals in conformity with such interests.

As a third set of sources of interest we find a number of things which, to any given person, promise a plus balance, but insecurely and in dependence upon corroborating forces. For a certain person each of the following announcements sets up an attitude of interest and an expectation that he will on the whole like the work, but the continuance of the interest and the degree of the liking of each unit of the work depends upon its special nature: (a) We are to read an article by X in magazine Y. (b) The topic of the next lecture will be *The development of transportation in the 19th century*. (c) Please take paper and pencil and, as I say a word, write down the first word that comes to your mind. (d) Make a list of twenty persons to whom you have recently tried unsuccessfully to sell goods; state the reasons why you failed in each case, so far as you can.

Next we reach a level where the general attitude is on the whole neutral, so that the special features of each unit of work must be relied on to provide interest in it. Finally there are cases where the general attitude is unfavorable, and special causes must be used unit by unit to make the work interesting.

The amount of interest in any small unit of learning by any person is then a consequence of that due to the nature of the unit itself, plus that gained by enlisting the common human passions and strong individual hobbies, and plus or minus that gained or lost by its appeal to any idiosyncrasies of the person. At any moment there is also a general and provisional attitude due to the total task, the experiences of the recent past, and the expectations for the immediate future. The task of that moment arouses its own degree of interest in cooperation with this general and provisional interest.

THE ACTION OF INTEREST

The next question concerns the ways in which interest operates upon a unit task of learning and upon the various mental connections which are used to achieve it. The operation is two-fold. On the one hand the interest acts in a forward direction to dispose the person toward certain behavior, making him connect the situations to responses different from those which would ensue if the interest were lacking. Notable among these are connections which produce bodily acts and attitudes of looking, listening and the like, which add impressiveness to the situations, which shut out or shunt off competing ideas and impulses, and which may in more subtle ways welcome, accept, and absorb the experience into the person's mental life. On the other hand it acts in a backward direction to make certain experiences satisfying and so to arouse a confirming reaction which causes the person to continue or repeat the behavior then and there if the situation remains, and, if the situation vanishes, to be more likely to repeat the behavior when the situation recurs in the future.

In the case of any small unit of learning the interest in it as expected, and in what is hoped for from it, start the behavior causing learning by their forward action, but they maintain it and direct it in large measure by their backward action. If the behavior is satisfying enough to arouse the confirming reaction, it is continued or repeated. Features of it which do not satisfy are not confirmed and are replaced by those which do. Acting in a forward direction interests cause attention and acceptance; acting in a backward direction they cause confirmation and strengthening. Interests thus exert a large fraction of their power in determining what shall satisfy and what shall annoy the learner.

The pedagogy of the forward action of interest is well known, but that of the backward action is well worth

consideration here. It has been in dispute; some of the most fundamental facts learned about its underlying psychology are of very recent date; they are important for the treatment of many aspects of adult learning.

We ask, therefore, the following questions:

1. What is the confirming reaction and what does it do?
2. How satisfying must the immediate consequence or after-effect of a single situation-response connection within a course of behavior be to arouse the confirming reaction?
3. What limitations are there to the kind of satisfaction that will in any given case arouse it?
4. What conditions must be fulfilled in respect of the way the satisfaction is attached to a tendency, if it is to confirm and strengthen that tendency?

Our answers to questions 1 to 4 will be designed to convey a maximum of truth and a minimum of error to workers in adult education who lack time and inclination to become acquainted with the doubts, reservations, limitations and conflicting circumstances which a more elaborate and technical account would mention.¹

1. The confirming reaction or "Yes" reaction is psychologically and physiologically the process of reinforcement acting on a connection. It is a process set in action by a satisfying after-effect, usually within a fraction of a second, whereby the ruling mental status of the moment reacts with a strengthening force. This force strengthens whatever connection it impinges upon, usually the connection that has just been active in producing the after-effect, less often the next preceding or next following connection. If one personifies psychological processes, one may say that a satisfying after-effect received at the headquarters of the mind causes the broadcasting of a "Yes" or "So be it" which is picked up by the troops then engaged in fighting and which leads them to continue their program. If

¹ A more adequate and more critical presentation may be found in *The Psychology of Wants, Interests, and Attitudes*, in *An Experimental Study of Rewards*, and in various special articles by Lorge and by Thorndike.

one mechanizes the procedure, one may say that a satisfying after-effect causes the release, at some source of power, of a quantum of force which is attracted to the place of contemporary activity and increases that activity.

2. A moderate degree of satisfyingness is adequate to arouse the confirming reaction. The announcement of "Right" plus a reward of a tenth of a cent arouses it nearly or quite as surely as "Right" plus four times as much money, even in children for whom the money is a matter of great importance. Suppose that an adult learner in the course of an hour of work makes 300 connections, that is, 300 responses to 300 situations, and that 100 of these have satisfying after-effects, of which 50 are of moderate amount whereas 50 are rich and intense thrills. Imagine for example that the former are money payments of two cents and the latter of two dollars. The second fifty connections will be strengthened little or no more than the first fifty. Indeed, the great increase in satisfaction will probably do harm by the disrupting excitement it causes. So far as the action then and there upon the particular item of learning is concerned, a very modest reward is adequate; and more than that is wasted. It may, however, be useful in maintaining interest during the minutes following, and in providing interest in similar sorts of learning on future occasions. If a person learning the meanings of Spanish words received ordinarily a penny at each correct response, but occasionally a dollar, he would probably remember the meanings rewarded by a dollar little or no better than the others, but his general interest in learning Spanish words then and later might be maintained or increased thereby.
3. Our third question concerned qualitative features of the satisfying after-effect which condition its potency to arouse the confirming reaction and so strengthen the mental connection. Consider these two sets of satisfactions in the case of a lesson in economics:—(I) the clarification of ideas, the attainment of acceptable answers to questions, praise from the instructor, and admiring glances from other pupils of the same sex at a brilliant remark which you made. (II) finding a dollar bill between the leaves of the book, remembering as a result of the instructor's reference to the Union Pacific Railroad where

you hid a bond of that railroad which for four years you have hunted for in vain, and receiving admiring glances from attractive pupils of the opposite sex quite irrespective of work done in the class. No psychology is required to decide that the first set of satisfiers will confirm the learning or parts of it, but that the second set probably will not; and in general a satisfier will be far more potent in confirming learning if it is *relevant* to the learning than if it is irrelevant. Merely happening at the time of the learning does not give a satisfier its full influence. Extremely irrelevant satisfiers may have almost zero strengthening influence. Indeed they may do more harm by disrupting or dislocating the learning than they do good by a possible slight confirming.

4. The same two sets of satisfactions will serve even better to illustrate the condition that a satisfaction must belong to a certain connection or tendency in order to exercise a strong and sure confirming influence upon it. Here as elsewhere, mere juxtaposition in time has very slight potency. The confirming reaction impinges usually upon the connection to which the after-effect arousing the confirming reaction belonged, and whose after-effect it was. In the case of finding the dollar bill, if anything is confirmed it is likely to be the tendency to turn over leaves. The person may (regardless of any thoughts that whoever or whatever put in one dollar bill may have put in another) turn over the next leaf.

There is very little danger in adult education at present of relying upon rewards which lack relevance and close attachment to the learning. If a policy of securing the maximum attendance and enjoyment with disregard of the actual amount learned should be adopted there might be great danger.

THE PERVASIVENESS OF THE CONFIRMING REACTION

It has been customary to regard rewards or satisfiers as rather rare events, such as the attainment of food or victory, the final solution of a problem, the teacher's announcement of "Right," or the arrival at a place of

rest or safety. These emphatic climaxes of satisfaction are, however, supplemented by a host of less dramatic but equally real rewards, by the attainment of a host of minor goals. The animal is satisfied by drawing near to food as well as by coming into actual contact with it. Each happy stroke in a game may be as truly a reward as the one that wins the point. Whatever promises progress toward a solution acts upon learning essentially as the final solution acts. The inner sense of success, correctness, competence does essentially the same work as the official outward assurance of success. Every step of the trip home may be affected with satisfaction derived from the expectation of arrival or the experience of approach.

Learning is not a series of neutral experiences punctuated by a dozen or so satisfactions and annoyances per hour. In reading a book, for example, the student is satisfied not only when he obtains the answers to the problems which sent him to that book, but also when he gets a meaning from a sentence, and even when he gets percepts of the words.

In general, whenever behavior is purposive, whenever, that is, the person wants something, events relevant to that want are very frequently accepted as satisfying or repudiated as annoying. A mild acceptance or tolerance is probably commoner than a strict zero or neutrality.

It is also the fact that much of what we call automatic or habitual routine is controlled, moment by moment, by residues from purposive behavior or goal seeking of the past. A person running or walking may not be aware of a series of satisfactions step by step as leg swings, foot finds support, and body moves on, but residues from past satisfactions from purposive acts of locomotion exist and are potent. So a student who has in the past gained many satisfactions from learning will have residues which dispose him favorably toward the routines of study. So

a worker who has profited from work in the past will have residues which make him like the routines of work.

It seems probable that this rather steady sequence of mild satisfactions help greatly to keep the learner's mind from harboring ideas outside the thing he is learning, wandering into day-dreams, and falling into inactivity or sleep. It seems probable also that efficient learning differs from inefficient more in these mild but frequent satisfiers than in the emphatic ones. It is certain that comfort in study and work is largely dependent upon the balance of mild satisfiers over mild annoyers.

THE INTERACTION OF MAJOR AND MINOR SATISFACTIONS

The influence mentioned earlier whereby the more intense satisfiers may suffuse and interpenetrate the details of learning and labor with a derived satisfaction is then of notable importance. It is one main problem of human engineering to administer rewards so that they add enjoyment to necessary routines as well as to dramatic outcomes. The influence of a teacher's praise should so far as possible penetrate the details of study at home. The interest in entering a profession should vitalize the routines of attending classes, taking notes, reading references and the like. The wage envelope should not act chiefly upon stopping work on Saturday, but upon each minute of work through the week. There is an opportunity here for profitable observation of notably successful teachers and managers, and for ingenious experimentation.

The reverse action, whereby the little satisfactions of the detailed activities of learning and labor contribute to establish large interests in certain topics and jobs, is also important. To a greater extent than is now realized, perhaps, a boy may become interested in experimental science because he likes the manipulation and tinkering with objects which figure so often in its details, or a man

may like farming because he likes the daily care of animals; or a woman may like nursing less for the triumphs of seeing patients get well than for the detailed acts of comfort and relief while they are ill.

There is one special care of the influence of the detailed satisfiers upon a more general satisfaction in the work as a whole which deserves treatment by itself, namely, the influence of their frequency. Suppose that a person attempts one after another a thousand tasks, beginning a new one every ten seconds. Suppose that on one day he succeeds with every task, on another day with 19 out of 20, on another day with 18 out of 20, and so on down to only 2 out of 20, only 1 out of 20, and none at all. Suppose that the series of tasks are alike in all respects except the percentage of tasks too difficult to be done in 10 seconds. What will be the effect of the difference in frequency of successes (and so presumably in the frequency of satisfactions), upon his liking for the task as a whole? What will be the effect upon his achievement, as measured by graded series of tasks used at the beginning and at the end of the series of 21000 tasks? Will there be a steady decline in interest paralleling the drop in the percentage of successes? If so, how fast will interest fall off? Or will there be no change until a certain critical point is reached and a steady decline thereafter? If the latter is the case, what is this critical point for any given individual or group, and what is the curve of decline in interest in relation to infrequency of successes thereafter? Will there be a steady decline in achievement? If so, what is its slope? If not, what is the critical point? These and other questions concerning the relation of interest and achievement to the frequency of successes or rewards deserve experimental determination.

We have made a beginning by experiments with adults comparing the achievement in a series of tasks in which successes occurred in one out of four of the tasks with that

in a series of tasks in which successes occurred in only one out of twenty. The essential facts appear in Appendix II. The loss is surprisingly small, and recovery when tasks within the person's power are reached seems to be very rapid. We have not measured the difference in enjoyment, but the indications are that here also the differences will be surprisingly small. If a person knows that the tasks are such that he cannot expect to succeed often, and thinks that he is doing well in comparison with other persons, he probably can study or work fairly happily even with only ten or a dozen successes per hundred. There are certain satisfactions in the work itself; and failures which do not frustrate expectations or damage self-respect seem to be rather temporary and restricted in their annoyance. So a tyro at hunting may be even very happy on the whole if he scores one hit in twenty, and even an expert fisherman may be content with one fish per twenty casts.

THE USE OF PUNISHMENT IN ADULT EDUCATION

Punishment is little used by teachers in what is commonly thought of as adult education. But it does occur, to some extent, in the form of rebuke, ridicule, or derogatory comments by the instructor or by fellow students, and it occurs to a great extent in the study of individuals in the form of error, failure, disappointment and the like. Except under very special forms of tuition a learner makes many errors. If he is told, or himself recognizes, that his answer, act, or response of whatever sort is wrong, that fact is an annoying after-effect. Similarly for a failure of any sort to respond correctly. The influence of such annoying after-effects or punishments, as they may properly be called, is obviously a matter of importance.

The orthodox doctrine used to be that a punishment was psychologically the opposite of a reward, that just as a satisfying consequence strengthened a tendency so an

annoying consequence weakened it. Recent investigations have definitely disproved this. On the contrary, in ordinary learning when a person responds to a situation S by a wrong answer R_x which is punished by the announcement of Wrong, or by such an announcement plus a shock or a money fine, the error or wrong mental connection usually is actually strengthened thereby. R_x is actually more likely to occur at the next occurrence of S than it would otherwise have been. The mistake does more harm by occurring than punishing it cures. Only if the annoying after-effect causes the person then and there to shift to some other response, is it efficacious.¹ It does not work back upon the wrong tendency to weaken it, as the satisfying after-effect works back upon the right tendency to strengthen it. It arouses no abolishing or weakening or denying reaction corresponding to the confirming reaction.

What it does accomplish depends upon the learner and the conditions of the learning. With human adults, and with opportunity after a mistake to try, try again until the right response is made, an annoying after-effect will commonly lead to trying something different and so eventually to the right response, which is then confirmed by its satisfying after-effect, and so in a sense aids learning. The aid however is meagre and can usually be given more economically. The aid consists in informing the pupil that such and such is wrong, and in stimulating him to try something other than it with a resulting increase in the probability that he will make the right connection. The positive learning occurs only when the right connection is made and confirmed. Other things being equal, the fewer the errors preceding it, the better. It might be, and has been, supposed that being punished for responding to S by R_x would at later occurrences of S arouse a memory that R_x was wrong, which memory

¹ Even in such cases it may do more harm than good.

would then cause the learner at least to avoid that particular mistake. And this doubtless often happens. But what happened oftener in our experiments with adults learning simple facts was that the occurrence of $S \rightarrow R_x \rightarrow$ Punishment strengthened the connection " $S \rightarrow R_x$ " more or oftener than the connection " R_x for S is wrong and will be punished." The learner would repeat his original wrong responses in a second round more often than he would have by chance alone. The tendency to do what one did before was stronger than the tendency to remember that it was punished.

Many proverbial maxims concerning learning have been notably inept. "Experience is the best teacher," "Repetition is the mother of studies," "Practice makes perfect," "Easy come, easy go," are a quartet of radically false slogans. As a fifth may be added "We learn by our mistakes." "We learn by our successes" is far truer. Some mistakes are instructive, usually either by suggesting avenues toward success, or including correct work along with them, or by providing information not easily obtainable otherwise. But even when promptly punished mistakes do not naturally destroy themselves, nor bring their own antidotes; their commonest function is to be a sheer hindrance to learning until they are displaced by the right responses which gain strength by being rewarded.

Interests then are much more beneficial when they cause a learner to be satisfied by what is good and right than when they cause him to be annoyed by what is bad and wrong.

This section so far is just a description of what usually happens with such annoying after-effects or punishments as are ordinarily used in adult education. The case is somewhat different with the very intense and impressive punishments sometimes used in schools, industry, and government. If the annoying after-effect is such as attaches fear, repulsion, shame or some other strong negative attitude very strongly to the tendency to make a

certain response to a certain situation, the punishment has a greater likelihood of weakening the tendency. When the situation recurs, the idea of making that response or the impulse to make it tends to arouse the negative attitude. Such punishments can weaken tendencies; they do have preventive value.

But they are dangerous weapons. First, they work best where least needed, namely, on persons who are specially sensitive. Second, they sometimes do not stop the tendency, but only make the person frightened, ashamed, and remorseful when he indulges it. Third, a person can immunize himself against all save the purely physical punishments, by ceasing to value the disapproval of the group which punishes him. An adult pupil may remove the sting of a teacher's sarcasm or ridicule by deciding that the teacher is a fool. There are other disadvantages.

In many of the cases where such punishments seem to work fairly well, what really operates is the reward principle. When *anything other than* a certain behavior is punished, the security from pain, fear, or shame which is attached to that behavior may operate as a positive satisfier. The comfort which follows A, not the punishment which follows Not A, may be the effective force. In all cases where the choice is between two alternatives, what begins as a neutral state versus annoyance may quickly transform itself into satisfaction versus annoyance. To the employers and teachers of the past these would probably have seemed distinctions without real differences. But there is a very real and important difference between having the confirming reaction operate on the desired behavior and having punishment or the expectation of it operate on the undesired behavior.

The successful use of punishments is a complicated matter and requires much more skill than the use of rewards. Punishment left to itself is rarely useful. It must be so administered as to lead the person to shift to

the right behavior and enjoy it, or to have such expectations from the wrong behavior that he is more comfortable to avoid it than to enter upon it.

THE PHYSIOLOGY OF THE BACKWARD ACTION OF INTERESTS

What we have called the backward action of interests by virtue of their influence in making the consequences of a mental activity satisfying or annoying is not logical, but biological. That is, a man's life is not determined by his interests in the way that a logical and omnipotent person would determine it, but in the way which the living neurones in man's brain dictate. By logic, a mental connection which was contrary to desire, was known to be so, and was punished, would be weakened. Its fate would be the opposite of that of a mental connection which fulfilled desire, was known to do so, and was rewarded. But actually there is no such simple dynamic opposition between desired and undesired, rewarded and punished. By logic, an after-effect in the form of a reward would act upon the connection whose after-effect it was and on nothing else. But actually we find the "spread" or "scatter" phenomenon wherein such a reward strengthens usually the connection which it most closely follows and to which it belongs physiologically, but also strengthens to some extent or occasionally preceding or following connections which are undesired, known to be so, and punished. Confirming reactions act not like the edicts of a just judge, but loosely and fallibly.

By logic, whatever potency a satisfier had should be in proportion to its intensity. But actually there is a law of sharply diminishing returns from increases of intensity beyond a certain amount.

Interests are biological facts. They act in accordance with biological laws. We can learn how they act only by observation and experiment.

CHAPTER VII

DIFFERENCES BETWEEN YOUNG ADULTS AND OLD IN INTERESTS AND ATTITUDES

IN many of our experiments on interests and attitudes we took pains to have young adults (aged 20 to 25 or 20 to 29) and old adults (40 or over, or, in some experiments, 30 or over) do the same things, learn the same facts, skills, and attitudes and respond to the same questions or situations, under identical conditions. We then studied the behavior of these two groups to discover what differences exist between the twenties, when most persons are learning much (trades, professions, marital adjustments, civic activities and the like), and the forties and fifties when most persons are learning little.

We had in mind such questions as these:— Are the old less curious and alert? Are they less ready to change their ways? Are they less able or willing to learn in spite of discomfort? Are they less able or willing to keep on in spite of failure and frustration? Are they less able to apply their minds to what is intrinsically of little interest or value? We were naturally especially concerned with any differences which would make such matters as learning a trade, acquiring a hobby, or understanding a political or social or household problem notably harder or more unpleasant for the old than for the young.

The general result of our labors in this respect is that whatever differences exist as a consequence of fundamental and necessary psychological changes with age are very moderate in amount, and will not prevent the older group

from doing at forty-five on a somewhat reduced scale almost anything which they could have done at the physiological acme of life at twenty-five.

How moderate the changes are in the field of desires, interests and attitudes may be estimated from the following samples from our findings.

LEARNING THINGS DEVOID OF INTRINSIC INTEREST OR VALUE

Ten young adults, aged 21 to 25, averaging 23, and having an average intelligence score of 412 (CAVD), and eighteen older persons aged 40 to 61, averaging 47, with an average intelligence score of 413, worked at learning correct and incorrect birth-years of celebrities and correct and incorrect meanings of rare English words. The average scores, after allowance for knowledge of the correct dates and meanings before the learning, were as follows for four periods on four different days:

	<i>Young</i>	<i>Old</i>
Correct birth-years	9.1	7.3
Correct meanings	7.1	6.0
Incorrect birth-years	8.9	7.0
Incorrect meanings	4.8	3.7

The old have correct/incorrect ratios of 1.04 and 1.62 compared with 1.02 and 1.48 for the young.

In memory tests occurring one to four days after the first learning the average scores (after allowance for knowledge before the first learning) were as follows:

	<i>Young</i>	<i>Old</i>
Correct birth-years	1.3	0.6
Correct meanings	1.7	0.9
Incorrect birth-years	0.38	0.13
Incorrect meanings	0.30	0.11

The correct/incorrect ratios in this memory test are high for both, but higher for the old (4.6 and 8.2 compared with 3.4 and 5.7).

The old are relatively inferior in learning and remembering the valueless false dates and meanings, but not greatly so.

In a similar experiment in learning correct and incorrect birth-years of celebrities twenty-two young adults learned the incorrect dates actually a bit better than the correct, averaging 8.4 and 8.0, with a correct/incorrect ratio of .95. Ten old adults averaged 5.6 for the incorrect and 6.7 for the correct¹ with a correct/incorrect ratio of 1.20. In the case of the correct and incorrect meanings of words, both groups did worse with the incorrect, but the older showed the greater difference. The averages were:

Young — incorrect, 3.9; correct, 5.9; ratio 1.5
Old — incorrect, 2.4; correct, 4.6; ratio 1.9

In a memory test twenty-four hours later the averages were as follows (after correction for the number known before the learning):

	<i>Young</i>	<i>Old</i>
Correct birth-years	1.09	1.17
Incorrect birth-years	0.55	0.27
Ratio	2.0	4.3
Correct meanings	2.7	1.5
Incorrect meanings	0.41	0.19
Ratio	6.6	7.9

The old adults thus retain about as much of the valuable as the young do, but less of the valueless.

Ten educated adults under 30 and fifteen over 30 studied four lists of birth-years of a hundred men each, spending fifty minutes on each list. The first and fourth lists were of celebrities; the second and third were of nonentities. The celebrity/nonentity ratios were almost identical (1.24 for the young and 1.20 for the old).

In learning true biographies of eminent men versus learning entirely false biographies of equal length and

¹ These measurements are after allowance for the correct dates and words already known, before the learning.

approximately equal difficulty, adults aged 20 to 30 were compared with others aged 40 or over in respect of the advantage of the true over the false. This advantage is greater in the case of the old adults. That is, the old adults suffer more from futility and harmfulness in the material learned. They do not suffer much more, however, the difference being about $1\frac{1}{2}$ score points, which is about a fifth of the standard deviation of the scores of young adults.

In retests after a week or a month the age-difference was again about one-fifth of the standard deviation of the score of young adults with the retests of true biographies. In this experiment the old thus were able to summon their energies and attend to the valueless biographies nearly as well as the young did.

When studying their third choice rather than their first from the Bible, the Book of Mormon, and Fraser's *Golden Bough*, the ten young adults of the twenty-eight fell off more than did the eighteen old, 16.3 compared with 13.1.¹ The difference is not at all reliable, having a probable error much larger than itself.

In an experiment in learning to typewrite in the ordinary manner and also to typewrite each word with the letters in the reverse order, the ten young adults of the twenty-eight mentioned above gained more than the older adults in ordinary typing but showed a still greater superiority in gain in the useless backward typing. They were thus apparently either less dependent on the sense of

¹ These numbers are obtained as follows: We find the average score for (1) Bible as first choice, (2) Bible as third choice, (3) Mormon as first choice, (4) Mormon as third choice, (5) *Golden Bough* as first choice, and (6) *Golden Bough* as third choice, using all records for the group. We find the average of 1 and 2, and find the deviation from this of each person who studied the Bible in the experiment. We compute the average of 3 and 4, and find the deviation from this of each person who studied the Book of Mormon in the experiment. We compute the average of 5 and 6, and find the deviation from this of each person who studied the *Golden Bough*. Using these deviation measures, we find the difference between first-choice score and third-choice score for each person.

intrinsic value in the work done, or less disturbed by the queerness of the task, or both. The median gains were as follows: Young adults: 50 for regular, $45\frac{1}{2}$ for backward; older adults: 32 for regular, 19 for backward. The younger group thus gained about $1\frac{1}{2}$ times as much in the former and about $2\frac{1}{2}$ times as much in the latter. The individual variation is large so that the results are not highly reliable.

On the whole, and rather uniformly, our experiments show the old adults more influenced than the young by uselessness and harmfulness in the material to be learned. But the difference is not great. So far as age goes, the requirements of intrinsic interest seem not much greater for men and women of 45 than for their sons and daughters.

We may estimate roughly that 10 or 20 percent more time would be needed for the old than for the young adults to counterbalance the change from fairly useful content to utterly useless or harmful.

REACTIONS TO FRUSTRATION AND FAILURE

In one of our experiments the subjects worked for about an hour with each of two long series of tasks, being allowed a fixed time ($7\frac{1}{2}$, 10, 12, or 15 seconds) per task. One series (called the "easy" series) contained such a number of easy tasks that on the average one in four was done correctly within the time allowed. The other series (called the "hard" series) contained so few easy tasks that on the average only one in twenty was done correctly. Two sets of twenty-six test tasks equated in difficulty were inserted in the course and at the end of the "easy" and the "hard" series.

The old did not do as well as the young in the test tasks or the tasks of the series, but that fact does not now concern us.¹ We wish to find the difference in the decrease

¹ The differences were of about the magnitude which would be expected from previous investigations.

in ability due to the more frequent frustrations of the hard series. Are the old more or less able to endure the lack of success without loss of ability than the young? In this experiment there is no demonstrable difference. The old had on the average 73% as many correct answers as the young at the beginning of the "easy" series and 68% as many in its inserted and final tasks. The old had 77% as many correct answers as the young at the beginning of the "hard" series and 74% as many in its inserted and final tasks.

In two similar experiments with twenty-five old adults and thirty-three young adults, the old had on the average $91\frac{1}{2}\%$ as many correct answers as the young at the beginning of the easy series and 119% as many in the inserted and final tasks. The old had 105% as many correct answers as the young at the beginning of the hard series and 89% as many in the inserted and final tasks.

If we combine these results with equal weights, we have the old scoring 82% as much as the young at the beginning of the easy series and $93\frac{1}{2}\%$ as much as the young in its inserted and final tasks. The corresponding percents for the hard series were 92 and $81\frac{1}{2}$. The old suffer more from being frustrated by deprivation of success than the young, but not much more.

ABILITY TO WITHSTAND IRRELEVANT BODILY DISCOMFORT WHILE LEARNING

In an experiment in learning under condition of mild bodily discomfort (due to keeping one arm extended horizontally) the old suffered greater diminution in the amount learned than the young, the drop being to 96% for the former and to 99% for the latter. The difference of 3 might be found to rise or fall considerably with further experimentation, since it is little larger than its probable error.

OVERCOMING AVERSIONS BY REPETITION
OF THE EXPERIENCE

Ten young adults (21 to 25) and eighteen old adults (40 to 61) were paid to take cod-liver oil fifteen times and hold a snake for ten seconds fifteen times in the course of nine days.¹ Each person reported his attitude at each trial in terms of the following scale:

RATING SCALE

You will be asked to perform certain tasks of different degrees of pleasantness. After you have performed each task you will be asked to rate its pleasantness for you on a scale from +100 to -100. Certain points on the scale have been described. The descriptions are suggestive. You may use intermediate ratings to represent your feelings clearly.

- 100 So unbearable that you would prefer death to repetition or continuance.
- 90
- 80
- 70
- 60
- 50 As unpleasant as a violent headache or toothache, or listening to a bore.
- 40
- 30
- 25 As unpleasant as a moderate burn, or a scornful comment about you.
- 20
- 10 As unpleasant as a glare in the eyes, or a slight frost-bite.
- +0 Utterly indifferent, like putting on your shoes.
- +10 As pleasant as a cool wind on a sultry day.
- +20
- +25 As pleasant as sleeping when fatigued, or a casual approval about you.
- +30
- +40
- +50 As pleasant as eating your favorite food, or enjoying your best friend, or drinking your favorite drink.
- +60
- +70
- +80
- +90
- +100 So pleasant that nothing could be more enjoyable.

¹ A description of the procedures is given in Chapter XVI of *The Psychology of Wants, Interests and Attitudes*.

The older adults reported slightly greater aversion to handling the snake and taking the oil at the outset than the younger ones did; and they did not overcome it so fully. But the differences are not large. The general facts are fairly represented by Table 2 which gives the

TABLE 2

The influence of repeated experiences upon the reported attitude toward handling a snake and taking cod-liver oil.

	1	15	15-1
	<i>First</i>	<i>Last</i>	
	<i>trial</i>	<i>trial</i>	
10 Young Adults			
1 . . .	-65	-3	62
2 . . .	-10	+50	60
3 . . .	-70	-5	65
4 . . .	-150	-5	145
5 . . .	-10	+10	20
6 . . .	-50	+20	70
7 . . .	-70	+35	105
8 . . .	-4	+10	14
9 . . .	-100	-70	30
10 . . .	+5	-10	-15
18 Old Adults			
11 . . .	-30	0	30
12 . . .	-10	0	10
13 . . .	-90	-95	-5
14 . . .	-11	0	11
15 . . .	-35	0	35
16 . . .	-10	-5	5
17 . . .	-200 ¹	-60	140 or >
18 . . .	-100	+10	90
19 . . .	-10	+25	35
20 . . .	-50	-3	47
21 . . .	-60	-60	0
22 . . .	-105	-50	55
23 . . .	-10	+5	15
24 . . .	-110 ²	-105	5
25 . . .	-60	+5	65
26 . . .	-90 ³	+40	130 or >
27 . . .	-10	-5	5
28 . . .	-75	-10	65

¹ Reported (1) -300, (15) -200 for snake, though limit was -100.

² Never would handle the snake.

³ Reported (1) -190, (15) -200 for snake, though limit was -100.

reported attitudes in the first (1) and last (15) trials, the data for "snake" and "oil" being combined. The averages for 1 and for 15 - 1 are: Young, -52 and +56; older -59 and +41 or less. The medians for 15 - 1 are +61 and +33. If we omit from consideration those scoring -10 or higher at the outset (i.e., those at or near neutrality at the outset), the average 15 - 1 is 80 for young and 55 or less for old; the medians are 68 and 51.

The difference between young and old in learning to handle the snake and to take the oil is about the same in magnitude as the difference found between age 25 and age 45 in ability to learn in general, and may not require any special differences in interest or attitude to explain it.

REPUGNANCE TO CHANGE

It is a general and presumably correct opinion that adults forty to fifty are less likely to change their religion, political party, social customs, eating habits, and the like than young people in their early twenties. It is to be expected that habits which have satisfied a person for many years should be well-fixed and cherished. One doctrine goes further than this, however, and asserts that age brings an increase in sheer repugnance to change as such, and in a bigoted adherence to one's own ideas, attitudes, and habits simply because they are one's own.

Experiment M was designed to throw light on this latter doctrine by using prejudices of which the persons had not hitherto been aware, which had never caused any particular satisfaction, and which required little or no effort to change. These are prejudices for or against the sounds of certain words.

In Experiment M the subject rated three times each of forty words for the pleasantness or unpleasantness of its sound. The subjects were already familiar with the scale and its use from having heard the correct ratings of 160

or more other words read four times each. Correctness meant agreement with a consensus of more or less expert adults. The conditions of the experiment were such that the gain in accuracy from his first rating to his second was due to no information from outside, but only to such changes as he could make by wiser second thoughts in view of having heard and rated the forty words once.¹

The gain from trial 2 to trial 3 was chiefly due to his hearing the series of forty words and the correct rating for each read by the experimenter, and then read a second time. Eight series of forty words each were used. The gain from trial 1 to trial 2 is small and the same for old adults as for young, 2.8 right estimates per person for three hundred twenty words. The gain from trial 2 to trial 3 is 114.7 right estimates per person for the young, and 119.1 for the old. There is certainly no evidence here that the old were more bigoted and unready to change their opinions to agree with the consensus, than the young.

If, however, we test the repugnance to change customs or opinions which have been long cherished we shall probably find substantial differences. For example, forty adults under 30 and twenty-four over 40 (all of whom were unemployed and in receipt of public relief because of their dire need for money) were asked to report on the fifty-one sufferings, mutilations and deprivations listed on pages 80-81.² All were habituated to experiments and questions of all sorts.

We are concerned here with the prices set upon items 32 to 36 (eating beetles, worms and human flesh), and items 44, 45, and 46 (desecrating things revered).

¹ If for example he rated eight words all as 10 (supposed to mean as pleasant as *tranquil* or *melody*) in the first trial, he could shift the less pleasant of them down to 9 in trial 2 with some probability of a better score.

² The replies cannot, of course, be taken at face value. A person setting a million dollars as the price for eating an earthworm might well do it for a hundred if someone actually put the cash before him. But differences between the replies of young and old seem likely to run parallel to what tests of the real behavior of young and old would reveal.

Name..... Date.....

For how much money, paid in cash, would you do or suffer the following. Write the amounts on the dotted lines. You must suppose that the money can be spent on yourself only and that whatever you buy with it is destroyed when you die. You cannot use any of it for your friends, relatives, or charity.

- 1. Have one upper front tooth pulled out.
- 2. Have all your teeth pulled out.
- 3. Have one ear cut off.
- 4. Have your left arm cut off at the elbow (right arm if you prefer).
- 5. Have the little finger of one hand cut off.
- 6. Have the little toe of one foot cut off.
- 7. Become entirely bald.
- 8. Have all the hair of your eyebrows fall out.
- 9. Have one leg cut off at the knee.
- 10. Have both legs paralyzed.
- 11. Have small-pox, recover perfectly, except for about 20 large pock-marks on your cheeks and forehead.
- 12. Become totally deaf.
- 13. Become totally blind.
- 14. Become unable to chew, so that you can eat only liquid food.
- 15. Become unable to speak, so that you can communicate only by writing, signs, etc.
- 16. Become unable to taste.
- 17. Become unable to smell.
- 18. Require 25 percent more sleep than now to produce the same degree of rest and recuperation.
- 19. Fall into a trance or hibernating state throughout October of every year.
- 20. Fall into a trance or hibernating state throughout March of every year.
- 21. Be temporarily insane throughout July of every year (manic-depressive insanity, bad enough so that you would have to be put in an insane asylum, but with no permanent ill-effects).
- 22. Same as 20 but for two entire years now, with no recurrence ever again.
- 23. Have to live all the rest of your life outside of U. S. A.
- 24. Have to live all the rest of your life in Iceland.
- 25. Have to live all the rest of your life in Japan.
- 26. Have to live all the rest of your life in Russia.
- 27. Have to live all the rest of your life in Nicaragua.
- 28. Have to live all the rest of your life in New York City.

-29. Have to live all the rest of your life in Boston, Mass.
-30. Have to live all the rest of your life on a farm in Kansas, ten miles from any town.
-31. Have to live all the rest of your life shut up in an apartment in New York City. You can have friends come to see you there, but cannot go out of the apartment.
-32. Eat a dead beetle 1 inch long.
-33. Eat a live beetle 1 inch long.
-34. Eat a dead earthworm 6 inches long.
-35. Eat a live earthworm 6 inches long.
-36. Eat a quarter of a pound of cooked human flesh (supposing that nobody but the person who pays you to do so will ever know it).
-37. Eat a quarter of a pound of cooked human flesh (supposing that the fact that you do so will appear next day on the front page of all the New York papers).
-38. Drink enough to become thoroughly intoxicated.
-39. Choke a stray cat to death.
-40. Let a harmless snake 5 feet long coil itself round your arms and head.
-41. Attend Sunday morning service in St. Patrick's Cathedral, and in the middle of the service run down the aisle to the altar, yelling "The time has come, The time has come" as loud as you can until you are dragged out.
-42. Take a sharp knife and cut a pig's throat.
-43. Walk down Broadway from 120th Street to 80th Street at noon wearing evening clothes and no hat.
-44. Spit on a picture of Charles Darwin.
-45. Spit on a picture of George Washington.
-46. Spit on a picture of your mother.
-47. Spit on a crucifix.
-48. Suffer for an hour pain as severe as the worst headache or toothache you have ever had.
-49. Have nothing to eat but bread, milk, spinach and yeast cakes for a year.
-50. Go without sugar in all forms (including cake, etc.) tea, coffee, tobacco, and alcoholic drink, for a year.
-51. Lose all hope of life after death.

The bids for 32, 33, 34, and 35 all together were clearly higher for the old. None of their bids were less than \$100, whereas a sixth of those of the young were. A third of the old said that no amount of money would induce them to eat any of these objects, whereas only a seventh of the young said this. The median price for the old was about

twice as high as that for the young. The same sort of difference appears for item 36. Two-thirds of the old said that no sum would induce them, whereas only a fourth of the young adults said so. Only a sixth of the old reported willingness to eat the human flesh for less than \$20,000, whereas a third of the young did.

The price set for spitting on the pictures of Darwin and Washington (average of the two) was over \$10,000 by two-thirds of the old, and by only one-tenth of the young. Nearly half of the young would do it for less than \$10, but none of the old would. Spitting upon one's mother's picture is so repugnant a proposal to the old that the majority of them leave it unanswered or say that no sum would suffice. Only a third of the young do so; and a quarter report that they would do it for \$10 or less.

Such evidence is complicated by differences in the mores taught in 1900 to 1913 and in 1920 to 1933, though these differences were probably nearly zero in the case of eating beetles, worms, and human flesh. It is also possible, though not likely, that the differences found between the reports by the old and the reports by the young would become much less if the situation were presented in reality.

Marple ['33] has shown that (1) high-school seniors, (2) college seniors, and (3) representative adults in the State of Iowa, stand in that order in susceptibility to positive influence by the fact that group opinion is so and so, and also by the fact that expert opinion is so and so. The differences were not, however, very great, and the difference between adults and collegians was only $1\frac{2}{3}$ times that between the young groups only four years apart.

The subjects reported their opinions (*Yes*, *Uncertain*, or *No*) concerning 75 statements.

The following are typical:

1. The installment plan of buying has done more harm than good to the stability of American economic life.
2. I favor government purchase of surplus agricultural crops.

3. The rate of gain in all occupations and industries should be regulated by law, as is now the case with railroads.
4. Real estate owned by religious organizations should be subject to taxation.
5. Teachers should be assigned to their positions by educational specialists rather than by school boards.
6. Attendance at chapel or other religious exercises should be optional in our schools and colleges.
7. Military training in schools and colleges should be optional rather than compulsory.
8. Declarations of war should be submitted to popular vote before becoming effective.
9. Lobbyists should be required to register, specify what interest they represent, then report to the government the exact nature and extent of their efforts to influence legislation or other governmental procedure.
10. I favor the renewal of diplomatic relations between the United States and Russia.
11. Would knowledge that a young woman smokes cigarettes prejudice you against her?
12. The Federal Radio Commission should prohibit the use of the radio for advertising tobacco.
13. A "bootlegger" has wrecked his car thirty miles from town on a cold winter night. Would you, knowing his business, aid him?
14. A owes B \$5.00 which he refuses to pay though he is able. B sees A drop a \$5.00 bill which he picks up. Is B justified in keeping the bill as payment for the debt which A owes him?
15. The white race is mentally superior to all other races.

After a month, three hundred persons (one hundred chosen at random from each group) were asked to report opinions about these same matters, but this time with cognizance of the answers which had been most commonly given by the group. Another three hundred did the same, except that these had cognizance of the answers which had been most commonly given by a jury of forty experts. Changes to agree with the group were 64%, 55%, and 40% for high-school, college and adult subjects, respectively. Changes to agree with the jury of experts were 51%, 45%, and 34% respectively.

How much of the greater obduracy of the old in Marple's study was due to their having had their ideas and prejudices longer and having been more satisfied by them, and how much to a general repugnance to change cannot be stated.

CURIOSITY

In another experiment young and old unemployed adults reported the time they would be willing to spend in prison at hard labor (but with no disgrace attached to them) for each of a long list of privileges, possessions, and experiences.

The following items may be used to give indications of the intensity of the interests in curiosity and adventures:

3. Ride on an elephant
18. See a man hanged
30. Chance to smoke opium
49. Ride on a camel
15. Hour's talk with Mussolini
16. Hour's talk with Stalin
50. Hour's talk with President Roosevelt (F. D.)
94. Hour's talk with Greta Garbo
95. See a bull-fight
99. Go up 15,000 feet in a balloon

They would do this very inaccurately for any individual, of course, but will be accurate for sufficiently large groups if no constant errors affect the groups.

There is no evidence in the estimates of any greater interests in these on the part of the young adults than on the part of the old. The same is true of the travel items which appeal to curiosity and mild adventure plus a certain freedom and luxury.¹ The facts in detail appear in Appendix V.

If people in the fifties have less curiosity than people in the twenties, it probably is due more to the fact that certain special curiosities have been appeased, than to a large decrease in the fundamental inner urge for new experiences in general.

¹ 8, see Niagara; 24, two weeks' trip to Caribbean; 51, two months in Florida; 52, two months in California; 59, one week in Washington; 75, year's cruise around the world; 76, year in Europe; 86, San Francisco and return.

CHAPTER VIII

INVENTORIES OF ADULT LIKES AND DISLIKES

ANY educational enterprise with adults will be planned and executed better with knowledge of their interests than without it. Some of these interests are useful means to learning, helpful in improving knowledge or skill or power or some other interests. Some of them may be, unless known and allowed for, barriers to such improvement. The creation and increase of some of these interests are ends in themselves whose attainment is an objective of the enterprise. Similarly some interests need to be weakened or abolished; some need to be modified, especially in the direction of changing the situations which arouse them, or, in the more usual phrase, the objects to which they are attached. Whether an interest is to be used as a means to learning or as some thing to be increased, decreased or redirected, it is obviously desirable to know whether the person in question has it, how strongly he has it, and just when and how he has it.

For the total enterprise of adult education two general inventories of adult interests will be helpful. The first will report the interests of adults or various groups of adults regardless of how they have been caused. It will simply try to describe what adults care about, like and dislike, in, say, 1935 or 1940 or 1950. The second will report the original or unlearned tendencies to be interested, which are determined by the genes in man's chromosomes, which are inevitable, except by selective breeding or other action on the germplasm, and which

are the raw material which environmental forces, — in particular, education, — modify.

ADULT LIKES AND DISLIKES, AS THEY ARE

The first inventory will assist the theory and practice of adult education to do the best they can with adults as they are at 20, or 30, or 40. The second inventory will assist education as a whole to make and execute its plans, and will enable workers in adult education to distinguish between tendencies that are very dependable because rooted in the genes, and those which may more easily be lost if not supported by the environmental forces which brought them into being. It will also assist workers in adult education to distinguish between tendencies that are hard to modify because due to the presence of certain genes, and tendencies which are easy to modify because due to forces that are within educational control.

There are two main methods of constructing an inventory of the first sort, that is, of discovering what any group of adults do care about, like and dislike. They may be required to think about the matter and give their testimony in answer to questions. Or somebody may observe what they do with their time, their money and other powers at their disposal. Both methods have serious difficulties, and need to be supplemented by special experiments. If a person has never had an opportunity to play a certain game or do anything like it, it may be necessary to teach him that game or something like it, observe his behavior, and take his testimony.

How accurate an inventory of the first sort can be made for any large group, such as all males aged 30 to 34 in the city of Detroit, in 1935, is not known. Nobody has ever tried to make such an inventory for even so small a group as a single class, or a score of mothers, or a dozen adult immigrants. If the reader will try to do it for himself

alone, he will probably need at least a hundred hours to canvas his memory, report its testimony, think of how he would like this and that if he had experience of them, record what he does with his time, abilities, money, etc., and why he does it, and combine all into a comprehensive statement of interests and attitudes to all the things, persons, qualities, activities, events, etc., which he may experience.

If the reader should try to do the same for the members of a class of thirty adults, he would have little or no time left to teach them. What one does is to assume some notions about what adults in general and these adults in particular like and dislike, so far as their likes and dislikes are relevant to what they are to learn in the class in question, and modify these notions from observations of their testimony and behavior, so far as class-meetings and individual conferences provide.

The notions with which one starts may be helped by various partial inventories. For example the reader will probably be benefited by reading Chapters I-IV of Waples' analysis of the testimony of adults concerning their interests in reading. (D. Waples and R. W. Tyler, '31, *What People Want to Read About*, pp. 1-109.)

The reader will also probably be benefited by considering the contents of newspapers, magazines, radio programs, and talkies; the expense, in time and money spent to increase attractiveness of person and dress, to travel and see sights, to keep animal pets, to hunt and fish, and to keep up with the Joneses or to get ahead of them. The sort of person who enrolls in part-time classes for adults is, of course, different from the average. He is more interested in science, art, skill, philanthropy and advancement in his life-work, and less absorbed in sex, sensory excitement, and esteem won by strength, beauty and display. But it is easy for the teacher to exaggerate the difference. He may, for example, assume that a learner's

interest is in knowing when it is largely in displaying knowledge and being regarded as a superior person.

The reader may also be benefited by remembering that there are deep-rooted cravings for attention, approval, submission, especially in their obvious external forms. A teacher may neglect the real welfare of his pupils without serious objection from them, but they expect him to call them by name, take their ideas seriously, and seem to treat them and their work as matters of importance! Being oneself submissive is also enjoyed if the master is an accepted hero, leader, or prophet, of unquestionably superior status. The egalitarianism so dear to generous idealists is alien to human nature; equality is precisely what human beings do not want. They want to boss or to submit to the right kind of boss.

Consequently, when it is necessary or desirable to use adult classes as means of training in cooperative effort on a basis of equality, the teacher should not expect this to fill a long-felt want, and to produce a class-spirit of zeal and contentment. It is more likely to produce the melancholy inertia of a party where each child does not speak until he is spoken to. In industry under the plan of group-bonus payments, the groups quickly of their own accord choose one member to act as foreman. Indeed the teacher will probably best at once have the group elect him leader, not only to avoid the risk that they will be bossed by some loud-mouthed doctrinaire or slick self-seeker, but also to make the class feel comfortable.

Those who arrange courses of study, or write textbooks, for adults should devote a reasonable amount of attention to the facts available in psychology, sociology, economics and history concerning adult interests and wants, even though anything like an adequate inventory is as yet unattainable, and the individual differences hidden by statements of fact about groups are very great.

ORIGINAL UNLEARNED TENDENCIES TO LIKE
AND DISLIKE

An approximately correct inventory of the second sort, restricted to those tendencies causing interests and attitudes which are inherited in the genes is not requisite, or even of much use, for the handling of particular enterprises in adult education. The students are as they are, and their teachers need not inquire how much of what they are is due to original nature and how much to modifications due to their past lives. It is, however, profitable for general theories of what can and what cannot be done by education. If, for example, we ask whether human beings could learn to love their neighbors as themselves, or to eschew war between and within nations, or to live as happily on 5000-acre farms managed like factories as on little farms each with its one family and their own animals, and how hard it would be to learn these things, and what correlated changes the learning would involve, then we do need to know what man's unlearned likes and dislikes are. An inventory of original satisfiers and annoyers is then the basis for argument. A social plan in accord with such original nature will be, on the whole, easier to accomplish, and will not require to be amended constantly as automobiles, airplanes, movies, talkies, radio, free verse, cubist art, the new physics, auxiliary languages, leagues of nations, and other novel elements are added to experience. It will be the easier to accomplish as it agrees the more with the following: —

Antiquity

It will include only interests and attitudes which have been in man during the entire historic period (in fact far back of that).

Universality

It will include only interests and attitudes which have been and are very widespread among the races of men and among individuals.

Sensory Objects

It will include only interests and attitudes which are aroused primarily by things perceived by the senses.¹ Man has no original tendencies to be moved by ideas or symbols.

Suggestions for a first selection of interests and attitudes to test as candidates for inclusion may be had from those characteristics of the primates in general.

Further suggestions may be had from tendencies which develop in human beings today *against* the force of the training received, or require little or no encouragement from training.

On the other hand, to make such an inventory will be harder to accomplish accurately, because it requires inference. What any given generation of men do like can be ascertained directly without peradventure; how much of it is due to original nature, that is, to the genes in their chromosomes, can be found out only by inference or by experimentation such as no modern society will permit.

No satisfactory inventory of the inherited basis of interests has yet been accomplished. The provisional one suggested in Appendix III is excessively vague and ambiguous in spots; where it is definite, it will be disputed by many. It should, however, protect us against the misleading doctrines which are advocated by some eminent, but one-sided, writers on sociology and education. A famous psychiatrist, for example, says that what mankind wants is "love and security." But a good case could be made out for the opposite doctrine that what mankind wants is "mastery and adventure." Some educators have assumed that man has a smaller outfit of original interests than the cat, dog, horse, cow or other species of mammals, whereas he has many more. Many sociologists have relied on the presence of an instinct of self-preservation and an instinct to perpetuate the species. But the former is really only a label attached to a host of specific tendencies

¹ Including the internal or proprioceptive senses.

(to suck, to pick up small objects, to put things into the mouth, to chew, to swallow things which arouse certain feelings and tastes, to spit out others, etc., etc) which by and large under ordinary conditions maintain life rather than destroy it. The latter is a misnomer for behavior in courtship and love, of which in the animal kingdom as a whole, not one part in 1,000,000,000,000 is caused by any intention of perpetuating the species. Animals other than man pursue their sex lives as they do any other parts of their lives, because they are moved to do certain things and enjoy them. They do them with no more consideration of the future of the species than the planets give to their future as they revolve about the sun. Man for the most part does likewise.

THE COMPLEXITY OF INTERESTS

Any one thing or fact or institution of modern civilized life may arouse a variety of interests or a compound of interests. For example, the interest in dress notable in women in America today has components from the interest in attracting favorable attention from men, from the interest in attracting favorable or envious attention from other women (and this is probably the stronger of the two), from the desire to be satisfied with oneself, and to have an inner peace and serenity which is comparable to the good conscience one has when assured of the approval of God, from the desire for mastery and relative superiority, and from the desire to have something rather than nothing to occupy one's mind. The interest in hunting animals in the United States in 1935 draws its strength not merely from the original zests of chasing, stalking, seizing, overcoming, and killing, but also from the attractiveness of outdoor life minus many of its major annoyances, from the relief from burdensome or irritating customs and civilities of life in a city home, from the favorable attention one

may receive from those who receive gifts of game or see the heads of moose, the skins of tiger and the like, and from the enlarged personality and self-approval which one attains.

The interest in leading an adult to take a certain course of study may similarly be much more than just the interest in the learning represented by that course. Vocational advancement, increased earnings, opportunities for sociable, or at least gregarious, activity, prestige values, and the restoration, maintenance or increase of one's good opinion of oneself — these and other aims indicate that interests in power, status, and approval are at work.

The student indeed may not know what he really wants. Adult education, like most human activities, shows persons doing certain things, assigning certain reasons for so doing to themselves, and assigning certain reasons for so doing to their friends, their teachers and others. Neither what they do, nor what they think in their heart of hearts, nor what they announce to others, is a perfect index of their real wants and motives. What they do is the best index of the three and what they announce to others is the worst. Here as elsewhere actions speak louder and truer than words. Action gravitates toward the satisfying; or, more accurately, selection of acts for survival in a person's habits is determined by their satisfyingness to him. If, after eight or ten experiences of certain activities, call them A and B, a person accepts opportunities for A and rejects opportunities for B, you may be fairly sure that he likes A better than B, no matter what he says. He may, and often does, deceive himself more or less by one or another conscious or unconscious subterfuge. But the person who reads the newspaper instead of some good book, saying that he would prefer the latter, but has only a few minutes on the train, or that he forgot to bring his book, or that nothing is really worth reading, or that he would read too long on the train if he had a good book, in

most cases enjoys the newspaper more than the book. By just the same token, the person who chooses the book rather than the newspaper, but says that he would much rather read the latter and that he chooses books only because reading them is necessary for his professional work, or will make him a better person, or will fulfill a deathbed promise, in most cases enjoys reading the book more.

CHAPTER IX

INDIVIDUAL DIFFERENCES AMONG ADULTS

COMMON observation shows that individuals differ widely in their interests. There is no game so popular that some individuals cannot be found who dislike it. The most odious task is a favored occupation for some. The results of common observation may be supplemented, refined and in some cases perhaps corrected by scanning Table 3, which shows the variation in reported liking at age 20 to 29 for the activities specified, in six groups of twenty each. As the reader scans these he should keep in mind that all the individuals in Groups Cc, Ct, and Cbl were college graduates of the same college at nearly the same date, and that those within any one group were engaged in the same profession (except that business men and lawyers were combined in Cbl). There was thus a substantial homogeneity in race and general training for all, and in special training within each group.

In spite of the similarities in race and education, the range for a sampling of only twenty persons extends over 7 or more of the 11 steps of the scale from least to most interest in 27 out of 51 cases, that is, in 53%; and over 5 or 6 steps in the other 24 cases.

The reported differences are even larger for the group of twenty-two non-college business men, for the twenty psychologists, and for the twenty women teachers, as shown in Table 3. The range extends over 9 or more of the 11 steps in 26 of the 51 cases. Clearly, individuals even though of similar levels of ability, vary markedly in interests.

TABLE 3

Reported frequency of each degree of liking at age 20-29 for 20 ministers (Cc), 20 teachers (Ct), 20 business men and lawyers (Cbl), 22 business men not college graduates (Nb), 20 psychologists, and 20 women teachers (Wt). The scale of interest from -5 to +5 runs from left to right as shown at the top of the page. Starred rows of frequencies sum to less than 20 (22 for Nb) because certain individuals did not report their interest in that activity.

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
1. Read fiction											
Cc						1	1	6	5	4	3
Ct	1						3	4	6	5	1
Cbl							2	3	2	8	5
Nb		1		1		2	3	2	4	3	6
Psy							2	4	4	4	6
Wt						1		2	2	6	9
All	1	1		1		4	11	21	23	30	30
2. Read non-fiction											
Cc							3	3	3	6	5
Ct		1				1	1	5	5	6	1
Cbl							4	1	5	7	3
Nb		2					4	4	4	5	3
Psy							1	5	4	7	3
Wt				3			3	4	3	6	1
All		3		3		1	16	22	24	37	16
3. Read newspaper											
Cc						2	8	6		2	2
Ct					2	1	7	6	2	2	
Cbl							3	7	8	1	1
Nb							2	2	11	4	3
Psy						3	7	5	2	2	1
Wt				2	1	3	3	5	2	2	2
All				2	3	9	30	31	25	13	9
4. Sports											
Cc						2	1	3	5	1	8
Ct						1	1	3	4	7	4
Cbl					1		1	1	6	5	5*
Nb					2	5	2	4	4	2	3
Psy					1	1	2	3	2	8	3
Wt			1	3				3	2	4	6*
All			1	3	4	9	7	17	23	27	29

* See table heading.

ADULT INTERESTS

TABLE 3 (Continued)

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
5. Outdoor Games											
Cc						1		2	4	5	8
Ct				1	1	1	6	1	2	4	4
Cbl				1	1	2		1	5	6	4
Nb		2	1	1	2	7	2	3	2	1	1
Psy				3		2	2	2	4	2	5
Wt			4	2	1	2	4	1		4	1*
All		2	5	8	5	15	14	10	17	22	23
6. Sedentary Games											
Cc	1	1		2	1	5	3	3	1	3	
Ct			1		1	4	5	3	2	2	2
Cbl						2	4	7	3	4	
Nb	1	1		2			7	3	3	4	1
Psy			1	2		1	4	6	3	2	1
Wt	2	1			2	1	4	3	1	4	2
All	4	3	2	6	4	13	27	25	13	19	6
7. Dancing											
Cc	3	1		2	1	1			1	2	*
Ct	2	2		1	2	1	1	4	2		1*
Cbl	1	1			1	5	1	1	6	3	1
Nb	1	1		1	1	2	2	3	6	1	4
Psy		2	2		1	3	5	2	2	2	1
Wt		1		1	1	1	2	2	2	4	5*
All	7	8	2	5	7	13	11	12	19	12	12
8. Music (play)											
Cc		1		1	1	1	2	2		3	2*
Ct	1	1			1	1	4	2		1	1*
Cbl	1	1			1	9	2	1	3		1*
Nb	1	2			1	5		8	1	1	3
Psy		1		1		9	2		3		2*
Wt	1	1	1		1	3	2	1		2	3*
All	4	7	1	2	5	28	12	14	7	7	12
9. Music (listen)											
Cc		1					3	2	3	5	6
Ct						2	7	1	4	4	2
Cbl					1		5	3	7	2	2
Nb							2	3	3	4	10
Psy							4	6	2	5	3
Wt					2	1	3	3	4	5	5
All		1			3	3	24	18	23	25	28

* See table heading.

TABLE 3 (*Continued*)

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
10. Theatre or movies											
Cc			1		1	2	4	3	3	3	3
Ct					1	1	4	5	2	5	2
Cbl						2	1	1	8	5	3
Nb								3	9	3	7
Psy						1	2	2	2	9	4
Wt						1		1	2	6	10
All			1		2	7	11	15	26	31	29
11. Regular job											
Cc							1		4	7	8
Ct							1	1	2	10	6
Cbl				1			2		5	2	10
Nb			1		2	2	2	3	7	2	3
Psy									3	8	9
Wt				1			3		2	4	10
All			1	2	2	2	9	4	23	33	46
12. Politics											
Cc		1		1		2	4	2	4	5	1
Ct			2	1	4	5	1	4	1	1	1
Cbl			1	2	1	7	2	2	2	3	
Nb			1	1		7	2	3	4	3	1
Psy			3	2	1	6	3	1	2	2	
Wt					1	9	3	2		3	*
All		1	7	7	7	36	15	14	13	17	3
13. Welfare work											
Cc							1	5	5	4	5
Ct				1	2	4	6	2	2	2	1
Cbl				3		4	4	2	4	2	1
Nb		1	1			9	4	4		2	1
Psy		1		3	1	5	3	2	4	1	
Wt				2	2	3	2	4	1		4*
All		2	1	9	5	25	20	19	16	11	12
14. Talk with old friends											
Cc							3	6	1	1	9
Ct							4	4	6	4	2
Cbl							2	2	6	5	5
Nb						2	1	3	7	4	5
Psy						1	3	5	2	7	1*
Wt					1	1	3	2	2	5	5*
All					1	4	16	22	24	26	27

* See table heading.

TABLE 3 (Continued)

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
15. Make new acquaintances											
Cc					2		4	5	2	2	5
Ct				1	1	1	3	3	7	4	
Cbl				1		2	3	4	2	6	2
Nb			1	1		1	1	5	4	6	3
Psy			1		3		2	2	6	3	2*
Wt			1	2	1	3	2	3	3	3	2
All			3	5	7	7	15	22	24	24	14
16. Travel and sight-seeing											
Cc							2	2	3	4	9
Ct							2	2	4	7	5
Cbl							1	2	1	9	7
Nb			1				1	4		7	9
Psy							1	2		10	6*
Wt			1				1		2	6	10
All			2				8	12	10	43	46
17. Idleness											
Cc	6	5	2	4	1		1				
Ct	7	3	3	2	3	2					
Cbl	5	3	2	5	1	3			1		
Nb	6	2	4	1	3	3			1	1	1
Psy	2	3	9			2	2	1			1
Wt	10	4	1			1	1		1		*
All	36	20	21	12	8	11	4	1	3	1	2

* See table heading.

These individual deviations from the central tendency of the group are rather fundamental characteristics of the persons in question. They tend to be permanent features of his make-up. The resemblance between his reported likes at 20 to 29 and his reported likes at 50 to 59 has a median of .74 for 50 persons taken at random from the Cc, Ct, and Cbl groups.¹ The effect of eliminating

¹ This .74 is a correlation coefficient computed by $\frac{\sum (xy)}{n\sigma_1\sigma_2}$ unless the distribution was so eccentric as to make some other method of computation much more advisable. It uses as the x's the deviations of 16 interests from the central tendency for that individual at age 20 to 29, and

chance errors of memory and judgment would be to raise this resemblance. The elimination of prejudices toward thinking that one must have changed since the twenties would raise it still further. The elimination of prejudices toward thinking that the interests possessed at the time of the report must have existed in similar amount in the twenties would lower it. From the comments made by the men who reported, I am convinced that infallible records made by omniscience would show closer resemblances than those computed from the fallible reports.

As further illustrations we may take the prices set by persons, all of whom were receiving relief in the form of

TABLE 4

Individual differences in the reported strength of certain aversions

		RANGE OF ESTIMATES	
		In 20 young men	In 20 young women
3+7+ } 8+11 }	Loss of one ear, hair, eyebrows; pockmarks.	\$4000 to ∞	\$30,000 to ∞
6	Loss of little toe . . .	500 to ∞	500 to ∞
32+33+ } 34+35 }	Eating beetles and earthworms . . .	4 to ∞	2200 to ∞
36	Eating human flesh . .	40 to ∞	500 to ∞
40	Snake coil around neck .	0 to ∞	10 to 7,000,000
41	Acting insanely in church	20 to ∞	15 to ∞
43	Acting foolishly on street	3 to 1,000,000	5 to 25,000
49	Very restricted diet . .	50 to ∞	100 to 750,000
31	Confinement in an apart- ment for life . . .	0 to ∞	50,000 to ∞
30	Life on a farm . . .	0 to ∞	10,000 to ∞

“made” work, and consequently were in great and approximately equal need of money, upon some of the mutilations, deprivations, etc., listed on pages 80, and 81. Table 4 presents some facts; and Appendix IV, others. Doubtless a part of the variation is due to carelessness and errors in self-observation, but after a generous allowance

as the *y*'s the deviations of 16 interests (Item 17 was not used in computations) from the central tendency of that same individual at age 50 to 59. It thus eliminates all influence from the fact that the person differs from the group in having a high or low *average* degree of interest.

is made for these, the variations in aversion to being deformed, handling snakes, eating vermin, being foolishly conspicuous, being a cannibal, being confined to a restricted diet, etc., are enormous.

Variations in the *relative* strengths of these aversions are equally striking. For example, take the price set upon being foolishly conspicuous in comparison with that set upon cutting a pig's throat. For 20 unemployed young men and 20 unemployed young women the ratios of 41 to 42 and of 43 to 42 were as shown in Table 5. Some report themselves over a thousand times as averse to the former as to the latter, and some as over a thousand times as averse to the latter as to the former.

TABLE 5

Individual differences in the relative strength of certain aversions. The frequencies of the ratios 41/42 and 43/42 in young unemployed men and women.

	41/42 ACTING INSANELY IN CHURCH TO CUTTING PIG'S THROAT		43/42 ACTING FOOLISHLY ON THE STREET TO CUTTING PIG'S THROAT	
	In 20 young men	In 20 young women	In 20 young men	In 20 young women
.00001 to .00009	1	2		3
.0001 to .0009	1	2	1	2
.001 to .009		2		
.01 to .09		2	1	6
.1 to .9		1	6	4
1 to 9	7	4	11	5
10 to 99	5	3	1	
100 to 999	4	4		
1000 to 9999	2			

The theory and technique of measuring the strength of interests is in its infancy. We may assume that, of any two interests in the same person in the same status which can be gratified at the cost of money, time, pain, or the like, that one is the greater for which the greater amount of money will be exchanged, time will be spent, pain will be endured, etc. If the money, time, pain, or other

quantity-scale is in equal units, the differences d_1 , d_2 , d_3 , etc., between any interests in the same person at the same time may be assumed to be proportional to the corresponding differences D_1 , D_2 , and D_3 between the money or time or pain equivalents of these interests.

If the amounts of the money or time or pain or other quantity are measured from a true zero meaning just not any of the thing in question (and this is true for money, time and pain), the ratio or "times as much" comparison may be made between any two interests in the same person in the same status. If the value of money or time or pain is alike for any two individuals, the strength of interests in one person may be put in comparison with their strength in another person.

Business and economics abound in data on the comparison of certain interests by money equivalents, though these usually require some additional study of the value of money or time, or both, to the persons concerned. It would not be fair, for example, to assume that A's desire to own a certain farm was equal to B's desire to own a chinchilla coat because A paid \$5000 for the former and B paid \$5000 for the latter.

We may illustrate the use of money as a measure by facts from a group for whom its value was presumably nearly equal, since they were all unemployed single men doing "made" work.

Suppose that, instead of recording their opinions about eating the beetle, etc., we had made *bona fide* money offers. The payments required would then measure actual aversions, and we could say that Individual A had K_1 times as great an aversion to eating a cooked worm as to eating a cooked beetle, K_2 times as great an aversion to eating a live worm as to eating a cooked worm, K_3 times as great an aversion to eating a live worm as individual B had (individuals A and B having been shown to value money in general equally), etc., etc.

"Please think how many days you would spend in prison at hard labor (but with no disgrace attached to you) in return for each of the following:

- ¹ For the sake of the illustration we will assume that the persons' replies are exact representations of what they would really endure to obtain each of the objects, experiences, privileges, etc.

The differences among individuals in the intolerability of going to jail are first equalized by dividing each bid by the bid made by the individual in question for \$500 in cash (and then multiplying by 100 for convenience). This being done, we find the following estimates in a sampling of forty-one individuals:

For books and education (5, 17, 74 and 97) a range from 0 to over 300 days.

For travel (8, 24, 51, 53, 59, 75, 76, and 86) a range from 8 to over 3700 days. The range would be continuous if we had enough individuals. Even with only forty-one, there are bids in every hundred up to 1000 days.

When measures of the strength of interest adequate to compare individuals are available we can learn what the form of distribution of *any* interest is in all men or in any specified group. What little evidence there is supports the view that interests, like abilities, are distributed in a group of the same age and the same conditions of life *continuously*, (i.e., with no gaps), and *unimodally* (i.e., with one amount of interest of greatest frequency and with steadily diminishing frequencies for greater and greater or less and less amounts than this). It is then unlikely that any group of persons seeking adult education will split sharply into many with very little interest of a certain sort, many with very great interest of that sort, and few or none intermediate. This will happen only when some one condition of life has a large influence on the amount of the interest, and when the group consists of some who have been subjected to that condition and some who have not. Such a split might occur in the case of certain interests if the class was a mixture of factory owners and factory employees, or of Christians and Buddhists, or of theologians and engineers.

Language tempts us to suppose that people cluster around opposed types in respect of interest, such as imaginative and realistic, matter of fact and artistic, humanist

and scientist, theoretical and practical, introvert and extrovert, excitable and phlegmatic. But this is usually fallacious, the great majority being usually of a medium status. Educational theories and practices founded upon the theory that people fall into two or three or four distinct types in respect of any interest or combination of interests should be viewed with suspicion.

Unless there is evidence to the contrary, it will also be prudent to assume that the mode or typical amount of an interest is at mediocrity rather than at either extreme.

There are several question-blanks available for making an estimate of an adult's interests. The Vocational Interest Blank by E. K. Strong is the result of careful study, and the significance of the answers has been studied, especially in relation to success and happiness in various vocations. It is reproduced, by permission of Dr. Strong, in Appendix VI. Although designed primarily to measure the extent to which the interests of a person agree with those of successful men in given professions, it may be used to answer many other questions, for example, concerning the interests in ideas, things, people, words, reading, skills involving chiefly large muscles, skills involving chiefly small muscles, animals, plants, art, music, responsibility, routine, neatness, and other activities or features of activities.

The record sheet shown below may be used to obtain in a very few minutes a rough sketch of an adult's interests, which is well worth having if it is made honestly. It may serve the leader of the class as a useful introduction to conferences about the plans for studies which various individuals have and as a first step in changing the members of a class from names and faces to living personalities.

Name..... Sex..... Age.....

Read the list of 50 studies, activities, etc., printed below. In the space before each, write 2 if you are sure that you liked it. Write 1 if you think you liked it but are not sure. Write 0 if you were indifferent, neither liking nor disliking it. Write -2 if you are sure that you disliked it. Write -1 if you think that you disliked it but are not sure. If you never had any experience of the study, activity, etc., write a question mark or an X in the space You are not expected to take great pains, or spend much time on this. Just think a second or two and then write your opinion. Remember that:

2 = sure liking

1 = probable liking

0 = neither like nor dislike

-1 = probable dislike

-2 = sure dislike

? or X = no experience to judge by

1. Mathematics
2. Grammar
3. Spelling
4. Foreign languages
5. History
6. Science
7. Manual training or sewing
8. Shop-work or dress-making
9. Drawing
10. Debating
11. Being alone
12. Going to church
13. Going to a party
14. Planning for a party
15. Giving the party
16. Cleaning up after the party
17. Working on a committee to secure money for a good cause
18. Being an usher or bridesmaid at a wedding
19. Having your teacher tell the other pupils that you are a model pupil
20. Having your boss tell the other employees that you are the best
21. Going round applying for a job
22. Working in a garden
23. Working in an office
24. Washing dishes
25. Going on errands

26. Working as guide on sight-seeing trips
27. Working with tools
28. Hearing and adjusting complaints
29. Writing letters to friends
30. Making new acquaintances
31. Being with your mother
32. Writing your diary
33. Quarreling
34. Taking care of a sick person
35. Learning poetry by heart
36. Learning a list of 1000 important dates in history
37. Learning the squares of the numbers 1 to 100
38. Shining your shoes
39. Repairing an automobile
40. Taking a clock apart and trying to put it together again
41. Taking part in a play
42. Making a speech to an audience of 100 people
43. Convincing an opponent that he is wrong
44. Trying to sell to a customer
45. Trying to make a merchant lower his price
46. Visiting people who owe you money and trying to collect it
47. Calling a policeman and having him arrest somebody who has cheated you
48. Making a cruel man stop beating a horse
49. Having people stare at you because your clothes are queer
50. Calling down somebody who is fresh to you

A convenient way to compare the individuals in a class with one another and with members of other groups is to give each person fifteen scores by summing his scores according to the plan shown below. As many of the fifteen scores may be computed as are of interest to the

I. Abstract ideas and thinking . . .	1, 2, 4, 10, 14
II. Observing and experimenting . . .	6, 9, 22, 40
III. Things and their mechanisms . . .	7, 8, 27, 39, 40
IV. People and their behavior . . .	5, 13, 26, 28, 30, 44, 45
V. Words . . .	2, 3, 4, 10, 35
VI. Sociability: company . . .	12, 13, 15, 17, 21, 11 reversed
VII. Approval of superiors . . .	12, 19, 20, 31
VIII. Display . . .	10, 18, 41, 42, 49
IX. Mastery: domination . . .	43, 46, 47, 48, 50
X. Cooperation . . .	15, 17, 28, 41, 33 reversed
XI. Litigiousness; trouble-seeking . . .	10, 33, 43, 47, 48, 31 reversed
XII. Conflict . . .	10, 33, 43, 44, 45
XIII. Talking . . .	10, 26, 29, 30, 42
XIV. Study . . .	Av. of 1, 2, 3; Av. of 4, 5, 6; 35, 36, 37
XV. Work . . .	16, 17, 22, 23, 24, 38

teacher. Like all such personal testimony records, these will suffer from any errors of self-observation or deliberate dishonesties of the pupils. But personal interviews will suffer even more from these errors, unless the interviewer is specially expert.

CHAPTER X

INTEREST AND THE DISTRIBUTION OF ADULT EDUCATION

FOR the purposes of this chapter, education will mean recognized formal education by schools, libraries, museums, excursions, and the like; and adult education will mean education after the age of twenty-one, whether given to full-time students or to persons who devote only a few hours a month to it. For convenience, enterprises providing day classes for students, most of whom are earning very little, such as the ordinary work of colleges and professional schools, will be called full-time education. Classes held outside of working-hours, or intended for students who are normally regular workers, will be called part-time education.

If the resources available for adult education were unlimited, how much of it should each person in the United States have? The general answer is "So much as he can use for the common good." This does not mean the utmost possible for each person. Some persons are uneducable beyond a certain degree or stage. They will be happier and more useful to be engaged in productive industry or at play. No refinement or nobility can be added to their lives by education beyond certain moderate amounts. It probably does not mean the utmost possible for *anybody*. To be forever getting culture but using none of it for research, teaching, professional services, enjoyment, or anything else is unhealthy and selfish for all save possibly a few eccentric book-worms who are happy at being book-worms and useful at nothing else. It certainly does not mean equal amounts for all.

The resources available for adult education are, and always will be, limited. The amount to be spent should be so distributed that no change in the distribution would increase the common good. If by taking education away from some one person and giving it to some other the common good would be enhanced, the distribution is imperfect and should be changed. This implies that those who can use large amounts of education best should have first claim upon them.

Present practise in distributing adult education is in many respects not in accord with this theory. By this theory (or by any reasonable theory), the purveyors of adult education would examine their clientele with care, and would plan to distribute their offerings where they would do the most good. On the contrary, they often neglect the problems of distribution, devoting most of their energy to increasing the amount distributed regardless of who receive it. Increasing the total volume of education in general, and of adult education in particular, is a beneficent undertaking; but its beneficence will be greatly increased if the education is given to those who deserve it most and will use it best. Enthusiasts for adult education should not repeat the mistake made by enthusiasts for the education of children and youth who have demanded more and ever more education but have neglected to consider at all adequately what should be done with it. Partly because of this neglect and partly because of a false notion of the function of education in a democracy, practise is likely to be based on the tacit or avowed assumption that adult education, or at least part-time adult education, should be distributed universally, that is, indiscriminately.

In the case of the education of youth the commonest effort of reformers has been to increase the compulsory period for all alike; and the arrangements for voluntary schooling thereafter have been such as to give almost as

many years of education to the dullest as to the brightest.

It is true that the abler children continue in school to high-school and college much oftener than the less able, but this is chiefly because they progress faster, not because they have longer schooling. In the case of a thousand boys in New York City who were tested at or near age 14 yr. 0 mo. and followed until they left school, the abler boys left at almost exactly the same age as the duller, the correlation between intellect and age at leaving school being $-.02$ in one group of 266 and $+.06$ in another group of 785. The correlation with grade reached was $+.59$ for the first group and $+.52$ for the other.

"I have examined the later school careers of the forty boys who had the forty highest scores of the 785 in abstract intellect and early school achievement and also the school careers of the forty boys who had the lowest forty scores of the 785 boys. When they left school, the ablest twentieth averaged only four months older than the lowest twentieth. The ablest twentieth had three semesters — that is, a year and a half — more schooling of which roughly one year is due to their entering school earlier and a half-year is due to their staying to an age four months older. The excess in schooling may not really be so great as a year and a half. Two pupils, one in the ablest and one in the least able twentieth, may have begun their schooling at exactly the same age and left at exactly the same age and still be recorded as having had, say, eighteen and sixteen semesters of schooling, because the former entered Grade 1A on entering school whereas the latter was put in a kindergarten or preparatory class or was given other irregular status so that his semester count, beginning with his official enrollment in Grade 1A and compiled from his later record of failures of promotion, may be reduced in comparison with that of the abler boy. I should myself estimate that at least one-half of the excess was thus spurious. The community, I should estimate, gives the ablest twentieth of the group about six months more schooling than the least able twentieth near the age of six and about four months more somewhere in the teens."¹

¹ Quoted from an article by the author in the *School Review*, May, 1932.

It would be very unfortunate if the distribution of education to adults should be based upon the doctrine that an indiscriminate scattering of education to all alike is desirable.

The actual distribution of adult education under present arrangements should be investigated. Far too little is known about it. The present provision of full-time education after age 21.0 certainly depends largely on parental ability and willingness to support children beyond that age, thereby excluding many deserving persons. To what sorts of persons part-time adult education is distributed is largely a matter of conjecture.

An even more mischievous doctrine is that plans for distribution should equalize education, giving most after twenty-one to those who had least before then. This *sounds* just and benevolent; it is plausible to argue that:

"Education is a good thing. A person deprived of it in childhood and youth should have it provided later. All men should have at least a certain minimum of it and no one person should be provided with much more than other persons, at least not at public expense. All men need it to develop their personalities and to make them good citizens. To each according to his need."

There is really neither justice, benevolence nor reason in this doctrine of equalization.

The fact that an animal has two legs and walks erect gives him no just claim to anything except to be called an erect biped. He may not even deserve to be called a man. If he has the mind and morals of a hog, it is just to treat him as a hog. If he has the mind and morals of a Newton or a Darwin, it is just to give him opportunities denied to an idiot, an imbecile, a dullard, or an average man.

There is certainly no benevolence to mankind as a whole in depriving intelligent, capable, and decent persons of education which they will use for the common good and bestowing it upon stupid incompetents who will learn

little or nothing from it and make little or no good use of it. There is probably no benevolence to the stupid incompetents. They do not want adult schooling, and will rarely be much happier as a result of efforts to supply their educational deficiencies. They and their children and their children's children will be enormously more benefited by the addition of a million dollars' worth of education to that given to the ablest than by receiving it themselves.

The use of adult part-time education to equalize the amount of education is the opposite of reasonable. It disregards the individual differences upon whose proper utilization the welfare of the world so largely depends. If education before twenty-one were properly distributed, the persons who had most up till then would be precisely the ones who should have more, and those who had least up till then would be those who had had all that was good for them to have. At its best, the practice of equalization in adult education is thoroughly unsound, unjust, and cruel. At its worst, when it uses education to compensate for deficiencies in native ability and past effort, it is a ridiculous perversity. Until the able and industrious have been given the adult education they need to serve the community, not a jot or tittle should be spent upon those who have shown only unfitness for it and misuse of it.

The argument against general equalization holds against the special form of it which seeks to avoid nuisances and dangers to society by providing adult education especially for imbeciles, perverts, habitual criminals, and for the morons, the unbalanced, the crooks or loafers, who are a stage above them. There are far surer methods than adult education of protecting society from these human poisons and defects. And defensive education motivated by fear is always to be suspected.

The same holds of the special form of equalization in upper ranges of ability which would select persons who are near the bottom of usefulness in some trade or profession

and give them education to reduce the harm they may do. Occasionally this should, of course, be done for special reasons. But as a matter of general policy, it is the best physicians, lawyers, teachers, clergymen, etc., not the worst, who should have first claim on the resources of adult education. The good that one of them gets from it will on the average far outweigh the harm that the inferior physician, lawyer, etc., will do from the lack of it.

Doctrines and practices of indiscriminateness, equalization, and compensation pay little or no heed to the learners' interests. Assuming education is good for all indiscriminately, then we proceed to force or entice all to take it. If those who have had less than the average should be leveled up, we go at leveling them without consulting their wishes. If we think that dullness, laziness, or degradation needs education as a palliative or preventive of misdoing, we allow no evasions.

Adult education, when not misled by these doctrines, has distributed its offering largely in accord with interest. Full-time colleges and professional schools use as a rule three main selective forces: A certain amount of intellectual ability, a certain financial status, and the interest of the individual. The latter may be variously compounded out of the following interests: in learning what the institution professedly teaches, in gaining admission later to some profession, in prestige, in living a certain sort of "college life," or in pleasing one's parents. Part-time adult education makes its selection still more by interest. Standards of ability and of financial status are much less prominent.

In spite of certain regrettable forms of advertising likely to entice students to study what they probably should not, the general working doctrine of adult education (except that directed for private gain) has been to provide certain opportunities for those who really want them. This elective system does not guarantee that the distribu-

tion of part-time adult education will be such that no change in the distribution would increase the common good, or that those who can use large amounts of education best will receive most education. Anybody of long experience in this field will recall cases of persons whose education might better have been given to others. But on the whole it has worked fairly well, and may be trusted to do so in the future. One reason for its success is that intrinsic interests and abilities are positively correlated to a rather high degree. If a person is interested in learning mathematics, and not merely in getting a degree or job by means of the knowledge, he is likely to have mathematical ability above the average. Another reason is, of course, that persons having an intrinsic interest in learning will be satisfied by learning and so will learn.

Selection by interest is extremely easy to administer. It also prevents individuals in authority from giving too free rein to their hobbies, and arranging curricula in accordance with eccentric doctrines about education, which may make the offering repellant to many good minds.

On the whole it seems prudent to start with an elective system of distribution of part-time adult education, and then improve it by observing when and where and why it fails to attract those who will make best use of education and correcting it accordingly.

In the case of full-time education, the selection in favor of wealthy parentage can be criticized on many grounds, but it has one strong defense. The children of the wealthy will have power, and so, other things being equal, can make fuller use of education than ordinary people can. Under ideal conditions power would attach to ability and devotion irrespective of race, family, friends, popularity, wealth, the love of power, or other irrelevant considerations, and under these ideal conditions education might be distributed in accord with ability and devotion alone.

But as long as wealth gives general power the wealthy child is, other things being equal, a better recipient of education. If adult education makes its recipients more reasonable and impartial, as it should, there is a gain to the community from having powerful rather than weak members educated. Similarly, if there is a ruling class, the education of a thousand of its members in science and the impersonal arts is, other things being equal, better for the community than similar education for a thousand of the ruled. If we could be sure who were destined to be captains of industry, labor leaders, popular actors, United States Senators, and other potentates, official and unofficial, the public could afford to pay liberally to keep them in the impersonal world of science and learning until well past the age of twenty-one.

There is a natural tendency for men of science and scholarship, who are relatively poor, modest, shy and inept at management or domination, to be prejudiced against the rich, aggressive, popular and masterful, and against their sons and daughters, even to the third and fourth generation. The tendency should be kept in check. The rich and powerful are as good as the average in intellect and morals, in fact somewhat better. Boys and girls should not be denied education because they are well-dressed, popular, and destined to have their way in the world.

THE DISTRIBUTION OF ADULT EDUCATION IN RELATION TO AGE

Certain facts and principles are obvious. The earlier an adult receives any given education the longer he has it to use. The longer its interval between learning and use, the greater the loss from forgetting. The best time for learning is, then, other things being equal, at or soon before the time of first use. This is likely to be also a time of strong interest in the learning. The slow loss of ability to learn

from about age 25 on may usually be disregarded as a minor factor. The still slower loss of the capacity to be interested and to enjoy reading, the natural and social sciences, the fine arts, social work, and the like, may surely be disregarded as a minor factor.

The best time for learning something which one can use and enjoy is, other things being equal, at the first chance one has, since circumstances may prevent learning it later. When, however, the use is limited and temporary, one may delay the learning until one is sure that there will be a use for it.

The custom of deliberately cultivating an avocation or hobby in early manhood and maintaining it dutifully for fear that old age with no regular vocation will be desolate, is questionable. If the avocation or hobby has to be acquired and maintained by effort, it is unlikely to become a great satisfaction just because one is old and jobless. Those responsible for adult education should not stress such a reason in arguments to induce adults to acquire knowledges, skills, and powers of appreciation. If a person does not like them in the twenties and thirties, he probably will not in the sixties and seventies. If he is the sort of person who will, if retired from his vocation, be unable then to find an interesting life, the early artificial construction of an avocation is unlikely to help him much. As a matter of fact, however, many of the men and women who testify that they do this or that from a sense of duty to insure old age against ennui, really do it because they like it!

In certain important cases education could not be given at the time when it was needed for use, because the need could not be foreseen; or if it could have been given then, it was not. One or the other is the case, for example, with education to prevent disease or crime. Education then must be remedial, curing or alleviating what would better have been prevented. Distributing education for

remedial purposes is, of course, often necessary, but it is a symptom of imperfect distribution in general.

The great majority of human beings tend to maintain the *status quo* when they are contented, and to be excited to changed activity when they are in trouble. It requires extraordinary sagacity and zeal to labor to improve what is already comfortable, or to continue doing what reason says is best to do, when pain and distress attach to doing it. The best model to follow in these respects is science and the arts. Scientists, inventors, technicians, and artists use the satisfaction of success as a stimulus to improve their work still more. When logic and skill seem to bring failure, they do not frantically try complaints, expostulations, incantations, or sacrifices. Agriculture, the trades, business and government have set rather bad models, being too often torpidly conservative in the bad sense when prosperous, and either palsied or aimlessly active with ill-considered expedients when in distress.

There will be tendencies from time to time to seize upon adult education for the public or its governing representatives as a remedy for this, that or the other difficulty in which a community finds itself. Such emergency uses will, as a rule, be an inferior sort of distribution deserving of suspicion. They are likely to disregard abilities, and to appeal to irrelevant interests. They may, however, involve far less harm and waste than other proposed remedies for the difficulty.

The distribution of adult education is only a fraction of the general problem of how the total amount of education should be divided up among individuals and at what times it should be given to them. American practises are in many respects faulty and unsuited to the conditions of life and labor that will characterize the next decades. Laws which force dull and incapable children who cannot reach a certain grade by a certain age to be kept in school, but permit bright children of the same age to leave school,

for example, are fundamentally wrong. Laws which compel attendance to a certain age, regardless of the abilities of the individuals, are imperfect. Laws and customs which concentrate education in the years from 15.0 to 20.0 instead of spreading it throughout life are questionable. It may be better for a boy to work some of these five years and study later; and there is much work that can be done as well by a boy of fifteen as by a man. The theories which support the present distribution of education, and those which are being used in the effort to extend it downward in nursery-schools for infants, are without proof. Indeed the evidence is strongly against some of them. The general distribution of education is, however, beyond the scope of this volume, and I will say no more about it.

METHODS OF DISTRIBUTING ADULT EDUCATION

The methods which need consideration are:

- A. Planning by real or alleged experts of the offering and of arrangements as to which persons are to use it, these arrangements being enforced by legislation or public opinion, in case some coercion is required.
- B. Such planning of the offering only, leaving the utilization of it to private volition and interests.
- C. Providing what the public wants, or what the interested fraction of the public wants, and leaving its utilization to them.

The offering and the conditions under which certain persons can make use of it being determined by A, B or C or by intermediate methods, various amounts and sorts of inducements and handicaps may be used to attract and repel learners.

Decision by experts from above as to who should study what, is desirable in proportion as there is developed a body of scientific knowledge, and genuine experts to apply it. Such development has begun, and may be expected to develop rapidly. Just as the development of biological and

medical science has led individuals to submit to control by experts in public health, grudgingly at first, but more and more willingly as the advantages of doing so became better known by the educated and as the habit of doing so becomes more firmly established in the uneducated, so the development of the educational sciences will lead individuals to submit to control by experts in education.

Control of only the offering, leaving the use of it to individual choice and opportunity, represents approximately the present condition in this country. Such control is potent. If, for example, an evening-college offered only courses in advanced mathematics, it would automatically distribute education only to intelligent mathematicians. If a library provides only fiction and superficial books of science, history, etc., it automatically selects against the intelligent and serious student. A reasonable method of distributing adult education for the present is to arrange the offering so as to give preference to those who have high ability, and can use education to increase their services to the community, and to make it possible for such persons to accept the offering. Libraries, for example, that arrange to send the books needed by young clergymen, physicians, and teachers who live at a distance, are promoting a desirable distribution. A fund to pay the costs of travel to and from evening classes for qualified students would be a reasonable philanthropy for any university. An important case of method B is its use by libraries, museums, scientific societies and clubs, and other institutions which offer dwellers in or near cities who have the ability and interest, books to read, exhibits and demonstrations to examine, discussions to take part in, lectures to hear, and the like. The extension of this service by traveling libraries and exhibits and by lending books by mail is obviously desirable. Such provision of help to those who are able and willing to help themselves is perhaps the most productive form of adult education. A few

dollars spent in removing impediments from the path of those who really seek knowledge and skill is likely to be worth many spent in enticing dull and sordid persons to a self-improvement which they do not really desire.

The question of barriers or handicaps to repel learners is not as yet a large practical issue in adult education. Except for entrance-requirements and promotion-requirements in evening colleges and high-schools, the general practice is to avoid all such. Indeed the requirements for entrance and promotion are likely to be relaxed for evening high-schools and colleges in comparison with the corresponding full-time schools.

The question of inducements by publicity, description of probable benefits, and alluring suggestions of various sorts is a practical issue, and a perplexing one. A safe course is to make all publicity purely informative, stating what the offering is, whom it will benefit, and how it will benefit them, and letting the individual's interest in that offering and in those benefits determine his response. But the promoter of adult education may feel that he should, for the good of the world, do more than this, using various more or less legitimate means to attract guests from the highways and byways to his educational feast. And perhaps he should. If his propaganda is not for profit, glory or indiscriminate numerical additions, and appeals to worthy interests, and promises only what can be performed, he is probably justified.

A defense can even be made for giving any of the public any education that they want on the ground that education of any sort of anybody will on the average be better than the idleness or commercially directed entertainment which it replaces. There are, however, surely better ways to distribute adult education than this. Some interests are better than others; some persons are more deserving of education than others; some sorts of education are better than others. Methods of distributing

education which count by noses and hours are surely improvable.

COMPULSORY EDUCATION FOR ADULTS

Nobody of importance, so far as I am aware, has suggested that education for a certain number of hours per year be made compulsory for adults. But somebody surely soon will, and it is profitable to be ready to judge the proposal by relevant facts.

The two chief arguments that may be put forward in favor of compulsory education for adults in the United States are as follows:

1. The world is changing so rapidly that what one learned in one's teens is inadequate.

2. Citizens may perhaps be left to their own volition or to special provisions made by employers, labor unions, etc., in respect of learning needed to keep up in their trades and professions, but most of them will not learn what they need to be good men, citizens, neighbors and parents unless they are compelled to do so. Both of these statements are true.

The unselfish argument against compulsory education for adults is that the same amount of money, time and care spent in providing opportunities for voluntary education and rewarding those who make good use of them will be more effective for the common good. This *con* seems to me to outweigh the *pros*.

It should be noted that two important reasons for compulsory education of children — that it protects against the greed of parents and employers and gives them what, on the whole, they themselves will regard as a better life than they would otherwise have had — do not apply in the case of adults. It should be noted further that recent discoveries in the psychology of satisfiers and annoyers strengthen the arguments against punitive and restrictive legislation in general.

CHAPTER XI

INTEREST AND THE CURRICULUM OF PART-TIME ADULT EDUCATION

No matter how intensely a group wished to learn how to open safes or pick pockets, no reader of this book would teach them. If a large enough group wished to learn logic or economics or child psychology, all readers of this book would probably provide the course unhesitatingly. There are topics that we would not put in the curriculum. There are topics which everybody admits deserve a place there. There is an order of merit decided by facts and opinions concerning the value to the welfare of the world of having such and such persons learn such and such matters.

The interests of the learners count in determining these estimated values, in the following ways: (1) If all else is equal, learning that is liked is rated as more valuable than learning that is disliked, because it means a plus in happiness. (2) Interest is valued by Dewey and his followers as a symptom that the learning is healthy, relevant to the needs of life, and progressive. (3) Interest is valued as a protection against the autocracy of a ruling caste in education, and (4) as an antidote to traditionalism, the "dead hand" of the past, the too rigid imposition of the ideas and ideals of one generation upon the next.

In full-time adult education, interest has little further influence on the curriculum. Its claims are supposed to have been satisfied, and the offering is not changed because any individual or group, even the entire group, of students likes one part of it better than another. Medical

schools would not change their curricula even if every student of medicine signed a petition to replace, say, the course in pathology by a course in "The social utility of medicine in a democracy." The temptation to change established curricula to fit interests exists in full-time schools but it is not very strong and is usually resisted.

In public or philanthropic enterprises for part-time adult education the temptation is much stronger. The spirit of the work is benevolent; the act of the learner in seeking education is regarded as commendable so that we try to please him; the work is regarded as so surely valuable that the loss from replacing part of it by a part less valuable but more interesting to the students seems relatively unimportant; the leaders of the enterprise are usually enthusiastic to increase its influence by adding students. In enterprises conducted chiefly or partly for private gain in salaries or profits or both, there is a selfish motive for modifying curricula in the direction of interest.

It is hard to tell just what should be done in changing a curriculum established on general principles that include proper respect for interest, by further concessions to special interests. It is easy to make a fine-sounding argument for maintaining standards, giving part-time students the best, and keeping education undisturbed by popular clamor and uncontaminated by cheap substitutes. It is also easy to make a stirring appeal for democracy in education, giving part-time students what they will take, and making adult education an effective competitor against idleness and ignoble recreation.

One thing seems sure. Whatever is done should be done honestly and frankly. If the course in history, or chemistry, or law, or engineering which the part-time student receives is mutilated, diluted, sugar-coated, or otherwise altered from the corresponding "standard" course in the college or professional school, he should know this. So should the public or the individuals who

support the enterprise. So far as is possible, a course should be so described as to inform everybody concerned about the abilities which are required in order to profit by it and the changes produced in persons of specified abilities who devote specified amounts of time and effort to it.

It also seems almost sure that a part-time course which is planned to produce the same benefits as a certain full-time course should not depart from the content of the latter save for reasons of weight. Except for such reasons, the content of courses in preparation for the professions should duplicate that of courses of similar aim in reputable full-time professional schools; the content of so-called cultural courses should duplicate that of courses of similar aim in reputable colleges and high schools. The same principle holds for courses in preparation for trades. Good reasons for altering the content of a course in a night-school will often be good reasons for altering its content in the full-time school also. If the full-time school includes useless theory or pedantic elaborations, or forces curricula into units which fit semesters or terms or the antiquated or eccentric notions of heads of departments, the remedy may begin by a change in the part-time course, but should extend to the other. The curricula of schools of all sorts should change in accordance with the advancement of knowledge and changes in human activities and ideals. Changes may well be inaugurated by alert and enterprising workers with part-time courses, who have freedom to act, but important valid changes in the curricula of the part-time college or professional school and evening high school will usually be valid for all. The chief exceptions are those noted in the next paragraph.

There are two weighty reasons which often justify alterations in method (as we shall see in the following chapter) and sometimes justify alterations in the curricula themselves. These are the age of the students and their experiences as workers, parents, and citizens. The his-

tory of Europe for men of fifty might emphasize economic interpretations in place of certain chronicles of adventure prevalent in courses for boys fifteen to twenty; general courses in human physiology for farmers, factory workers, and clerks might replace certain minor features of a high-school or college course by special chapters on parasites, work and fatigue, and vision respectively. Psychology for parents might replace the section on animal behavior by a section on infant behavior.

Whether or not ordinary "standard" curricula will be much improved for use in part-time adult education by such alterations to fit age and experience, there should be a large group of special opportunistic courses of study especially needed by adults. Familiar cases are: foreigners who need to learn to speak or read English; young women about to become mothers who need to learn how to protect the health of the embryo and their own; mothers who need to learn about the care of children; teachers, doctors and clergymen who need to keep up with advances in their professions; cotton farmers who need to learn how to grow a diversity of crops; citizens who need to learn how to cooperate; consumers who need to learn tests of materials; and so on through a long list of groups with needs different from those met by ordinary academic courses. Here part-time adult education should take the lead and establish the standards.

In such special opportunistic courses, the curriculum may even be extemporized anew for each class, as MacKaye suggests, by an instructor "who enters the adult group with the expectancy of doing some unplanned thing in a unique emergency."¹ It may be a miscellany of lectures, debates, and discussions aimed "to establish living values — courage, adventure, curiosity, and a determination to be oneself," as at the Sconset Summer

¹ MacKaye, David L., '31, "Tactical Training for Teaching Adults," *Journal of Adult Education*, Vol. 3, pp. 290-294.

School directed by Frederic C. Howe.¹ On the other hand, it may be a more integrated program than that ordinarily laid out for college students, as seems to be the case at the Bryn Mawr Summer School for workers, where students are classified in groups according to ability, and the three teachers for each group (in economics, English and science, history or psychology) plan their work together. It may be simply a chance to paint or etch twice a week with occasional exhibits and lectures by noted painters or critics, as in the Business Men's Art Club of Chicago. Or it may be a rigorous series of exercises to attain a definite status of skill in some fine or useful art.

An interesting case of an extremely informal and flexible curriculum is the new experiment at Leipzig described by Hüls ("Adult Education in Germany," *Journal of Adult Education*, Vol. 2, pp. 427-433). About ten workers live together with one or two academic students or teachers or other professional persons. They work during the day. Three evenings each week are devoted to discussion and study; the rest to social life and sports. These twelve persons live together for a whole year, and cover household expenses by giving two-thirds of their wages to the home. They study industrial, economic and social questions and life problems. The teaching is "like darning socks;" the teacher "sees a hole" and "puts some knowledge in."

Though informal and flexible, the hundred and fifty evenings spent in discussions and study could be spent in very definite acquisitions if the group were so minded.

As life becomes more reasonable and planful it will become more and more customary for people to seek education for each activity in which they engage. From the time, say at twenty, when he takes his first job and tries to read up on it, or plans to buy his first car and tries to learn from impartial sources what sort of car to buy until,

¹ See note in the *Journal of Adult Education*, Vol. 1, p. 193f.

fifty years later, he considers retirement from work and reads up on that or decides how to bequeath his property, a prudent person may look to libraries, evening-classes, government bulletins, and the like, a score, a hundred, even a thousand times for special education.

People in general are learning to use systematic study as a guide to action.¹ Experts in part-time adult education will, and should, specialize in preparing courses requiring from ten hours or less to a thousand hours or more for these special groups of learners, adapting existing courses or parts of courses where that is advisable, or developing radically new contents.

Our educational needs as human beings, as citizens, as neighbors, as parents, as productive workers, as hobbyists—our circumstances of locality, available time, interests, abilities, and previous training, and the facilities that are or should be available, set the main conditions to which courses of study should be fitted. The content of any given course will usually be the result of a compromise, and conceivably a dozen courses of the same length on the same topic might be equally good, each possessing some advantage which was balanced by different advantages in the others.

In full-time schools objective tests of ability or aptitude and of achievement are being used to great advantage in deciding what courses a person may be expected to profit from, and how much he does in fact profit from the courses that he takes. They should be even more useful in enterprises for part-time education, which deal with groups having a greater variety of ability and with courses the results of which are less well known by experience.

There are three main sets of facts obtainable by objective tests which help to decide whether a given individual

¹ In the year 1930 probably more persons in this country studied contract bridge from books, articles, or in special classes, than studied Greek in full-time schools during the past ten years.

should take a certain course, or which of several courses on the same general topic he should take. The first is a set of measures of capacity (such as a so-called general intelligence score, which is a measure of intellectual ability with words, numbers, and other symbols and abstractions, a score for mechanical dexterity, a score for musical capacity, etc.). One of these scores prophesies more or less well how difficult tasks of a certain sort the person can perform, and to some extent how quickly he can perform easier tasks of the same sort. Persons below a certain score in "general intelligence" simply cannot learn algebra or the theories of "marginal" economics, or philosophy, or theology, or the treatment of constant and variable errors in statistics. They could not if they studied the topic fifty times as long as the average college student does. On the other hand, a person with a sufficiently high score may profit from the study of the history of philosophy though ignorant of Latin, Greek, and history, may learn to deal with constant and variable errors though ignorant of the calculus, and will indeed manage somehow in all sorts of courses without the knowledge usually demanded as a prerequisite.

The second are a set of measures of accomplishment, achievement, status or equipment in the form of power, skills, or knowledge, such as are now being used to permit students to take an advanced course instead of an elementary course, or to receive credit for a course without attending classes, etc. An efficient part-time school will know definitely what the prerequisites in the shape of knowledge, skill, etc., are for the profitable undertaking of each course in its curriculum. It will protect its students against trying to do what they are not equipped to do, not by burdensome requirements and restrictions, but by a direct test of what the student knows and can do.

The third are a set of measures of interests which may prophesy how satisfying various sorts of learning and their

results will be. Interest cooperates with capacity and equipment and may compensate for their deficiencies. If A is content to work twice as long as B to learn a certain thing, A may be encouraged to study it in spite of a certain inferiority to B in capacity. If A is willing to add to the regular load the burden of making up deficiencies in equipment as he goes along, he may be permitted to attempt a course in spite of the lack of some of its prerequisites. Tests of interests are unfortunately not yet validated and easily interpretable, but rapid progress may be expected. Samples of the instruments now available for measuring capacities, accomplishments, and interests in the case of adult students are shown in Appendix VI.

Knowledge of how much part-time adult students do profit from the courses which they take is imperative for prudent management of adult education. Complete knowledge is, as with other educational influences, very difficult to obtain, and some of the changes produced in the persons concerned may be so subtle, or so hidden, or so long delayed in their effects, as to elude ordinary observation entirely. Acquiring certain facts about painting, or learning to play the violin in an orchestra, or to pass an examination for accountants, may alter the learner in unsuspected ways, or in his behavior of a decade later.

But the less we must leave to faith and hope, the better. And in many cases the avowed purpose and presumable justification of the study, practice, experience, stimulation, or whatever the educational activity is, lies chiefly in definite changes in the person, which suitable ways and means can measure or at least estimate.

Adult education should profit by the experience of schools in general in this respect. They built up an elaborate accounting system of marks on daily recitations and marks on formal examinations which was intolerably time-consuming and inaccurate, and which gave ostensible measures which were not comparable between different

schools or even between different teachers in the same school, which could not justifiably be added or averaged, and which did not inform anybody concerning how much knowledge, skill, power or anything else the recipient possessed. Their only assured validity was to give an order of merit within the group marked by one teacher, and to give a notion of the status of a student to those who were acquainted with the standards of the particular teachers who rated him. Only within the past score of years have they learned to employ examinations in which the idiosyncrasies of individual teachers are eliminated or reduced to a minor role, which are scored objectively, and which report definitely what the pupil does know or can do.

Adult education should keep its accounts of educational results in the form of statements of the actual changes in the persons concerned such as any competent person can interpret. This implies that it should use objective and standardized tests wherever such of good quality are available. Certain enterprises may prefer to keep no accounts at all, devoting all their energies to doing the best they can for students and leaving the outcomes unrecorded and unknown to all save the participants, or unknown even to them. And this may be justifiable. It should not, however, be justified on the grounds that adults are not interested in definite statements of results. On the contrary they are very eager to know how they stand and how much they have gained.

Nor should it dispense with an accounting of results on the ground that the results are in all cases surely very beneficent and the exact degree of their beneficence is of minor consequence. On the contrary it is probable that the value of the various enterprises in adult education (of, say, the United States in 1924-1934) to the individuals concerned varies down to zero or negative quantities. Knowledge of the results of curricula is needed in order to evaluate them and to guide future practice. A wide

range of experimentation in the offering to adult learners is permissible if the results of each experiment are measured objectively, so that the experiments can be repeated and the results verified.

CURRICULA OF ADVICE

There is a special sort of curriculum now administered informally by various persons which might perhaps be given a more established and definite status in adult education, namely, the giving of information and advice about which books to read, whom to consult, where to go, what to do, and the like, in order to better oneself in this, that, or the other respect. Librarians, teachers, officers of museums and science clubs, journalists in charge of inquiry columns and others may be said to conduct "courses" lasting perhaps only a few minutes, very closely correlated with the learners' interests, telling ways and means of satisfying these. The "content" of any such "course" could be improved by better knowledge of the capacity, equipment, and interests of the person, as well as by better means of securing cooperation from experts in regard to what is recommended for him. It is conceivable that arrangements could be made whereby any person who wished to educate himself in any desirable way could receive impartial and reasonably expert guidance, and that the way to obtain it should be as widely known as the way to obtain an automobile license or to be registered to vote. The service could be provided privately under the control of universities, foundations, scientific associations, or other impartial bodies. Or it could be provided publicly as an extension of what is already done for farmers, manufacturers, parents, and others, by various state and federal bureaus.

There is probably not at present a very wide demand for such guidance. The number of requests received by

government bureaus, universities, libraries, departments of education, adult education associations, Y.M.C.A.'s and the like is probably not equal to one per year per dozen adults. And this is in spite of the expense of much time and money in offering the various services attractively. But the various services are specialized and the actions required are perhaps too strange to compete with the old habits of doing what some acquaintance suggests or of doing nothing. If there were information-offices, as well known as post-offices, to which a man could go or write, the case might well be different.

If men form the habit of continued self-education for practical needs and cultural benefits, they should not have to rely on the incompetent advice of acquaintances or the prejudiced advice of advertisements, and they would readily form the habit of seeking guidance from such "Information-offices." It is not only the unprivileged and ill-educated who would need them. Outside of his own field, the physician, or lawyer, or engineer is, and will increasingly be, at a loss to tell which books and articles will be comprehensible to him, which will probably solve the problems he has in mind, and even which will be trustworthy. If, as seems possible, the publishing business should become so commercialized that books on serious topics were made simply or chiefly to be sold, his case would be much worse off than now.

MATERIALS OF INSTRUCTION FOR ADULT LEARNERS

When a curriculum is put to work its actual contents are commonly called the materials or means of instruction and the ways in which they are used are called the methods of instruction.¹

¹ The persons to be educated are sometimes called the material of education, only the words *means* or *instruments* being used for the lectures, readings, experiments, exercises, etc., which constitute the contents of the curriculum.

One of the commonest needs expressed by workers in adult education is for materials or means devised for adults rather than for children and youth. In the Southern states it has been found that, in spite of obvious defects, the Bible is a better text-book to teach reading to adults than the childish primers and first readers. The aural familiarity with certain words and passages and the reverential interest in the Bible operate strongly in its favor. In general, everyone must agree that, other things being equal, the materials or means used in adult classes should take advantage of the experiences and interests which normally accompany age. A text-book in economics for men who have earned their living may thus differ from one for students in high schools and colleges. Facts and theories about government may receive different emphasis in teaching those who have voted, paid taxes and served as conscripts than for school children. Instruction in sex hygiene, if it should become customary, should obviously rely on a very different background of experience and interest at thirty than at thirteen. The variation in experiences is, of course, greater with adults.

Negatively age is likely to have established certain attitudes and interests which may require more varied and alluring materials to stimulate learning. Some adults may have developed obsessions against mathematical formulas, graphs, maps, looking up words in a dictionary, problems to be worked, memorizing lists, reading above a certain level of difficulty, answering questions, performing in public, doing anything strange, etc., etc. These are more or less offset by increased love of books, readiness to listen to lectures, radio-talks and the like, zeal for experiments, and attractiveness of formulas, graphs, maps, etc., in other persons. The net result is that the average interest in the customary sorts of educational material is about the same in adults as in young people, but the variability is greater.

An adult who takes a part-time course may have, as a result of unwise propaganda or of his own misjudgment, exaggerated expectations. He may think that a few score hours will make him competent to repair automobiles, or that reading a few books will greatly improve his salesmanship, or that a series of lectures and discussions about socialism will settle a host of questions. The actual materials of the courses hour by hour may produce so small increments of skill or power that he loses interest.

An adult also may consider certain drill exercises, reviews, and problems as assaults upon his dignity.

He has also the option of leaving the part-time school altogether, whereas the young student can usually only exchange one curriculum or set of materials for another.

These facts, together with those noted at the beginning of this chapter, support the claim that even when the general nature of a course is the same for old and young its specific materials may often profitably be altered, provided this can be done at no sacrifice of their merits in respect of accuracy, clearness, simplicity, vitality, and other desirable qualities.

This proviso is important. There would be no gain for adult interest or achievement if text-books, specialized for them, but violating sound general educational principles, and weak in the general factors of interest, were substituted for text-books designed for children but well-adapted to arouse interest and aid learning. There is a grave risk when a teacher of an adult class substitutes lectures or discussions of his own devising for a standard treatment because the latter seems to him too juvenile. The instruments of instruction used in full-time schools embody substantial improvements due to the psychology of learning, scientific studies of teaching, and practical experimentation. They are demonstrably better than those available two or three generations ago, or even a generation ago. History should be written differently for

adults, but unless this is done with genius and expertness the product is unlikely to be as useful for adult classes as the children's books of, say, Beard and Bagley, Rugg, and Van Loon. The chief cause of interest in a person who wishes to learn anything is success in learning it. If adults find themselves learning reading, arithmetic, or German from childish exercises, they will tolerate them.

The available text-books and other materials for learning should be appraised from the point of view of the needs of adult part-time students of various sorts. In some fields new materials should be provided; in some, amended editions of existing materials will be desirable; in some there will be little reason for any special adaptations, the time and energy being better spent on improvements for all learners.

In general, the greatest gain per unit of money, time or ability spent on improving materials of instruction for adult learners, will, in my opinion, come from thought and work designed to improve them for all learners. For example, the work being done by Faucett, West, Palmer, and Swenson in preparing better materials for teaching English to Orientals, Africans, and foreigners in the United States is valuable for teaching English to anybody learning it as a second language, and, in fact, for teaching any foreign language to anybody. The work done by Rugg in providing instructive concrete details for use in teaching the social studies to children 10 to 15 years of age is valuable for teaching the social studies to adults, and to some degree, for teaching any science to anybody. The experiments carried on at Yale, Harvard, Chicago, and elsewhere concerning the results from the use of moving pictures with children are instructive for teaching all persons of corresponding levels of capacity and equipment.

Conversely the changes suggested or made for specialized adult part-time classes would often be admirable for almost all learners. For example, the *Workers' Education*

Year-Book of 1924 quotes from a letter of C. J. Hendley approvingly the following:

"My notion of a labor-class text-book is that it should be a pocket-size volume containing about twelve lessons of, say, 20 pages each; that it should be written in a style that would lure students to further reading; that it should contain detailed references and directions for more thorough study; and that it should be developed inductively from familiar facts and concrete data to general principles; simplicity and clearness are of paramount importance in such literature; should treat ostensibly commonplace problems that an average serious-minded workman faces in his everyday work but in reality introducing him to great principles and ideals of social and economic progress."

Would not text-books up to these specifications be useful also in high schools and colleges, for home-study courses for teachers and clerks, for women's clubs and civic leaguers? A sagacious publisher would gladly issue such a book even if there were no workers' classes to use it.

With its freedom from traditional restrictions adult education can, and should, operate each year a certain number of promising experiments; and these should often contribute to the improvement of education in general.

GRADATION AND PROGRESSION

Educators have long sought to arrange the materials of instruction so that pupils are prepared by what they have learned to make the next step safely and economically. And recent text-books, syllabi, job specifications for learning, and the like have made substantial advances along this line. Sound procedure now divides the total desirable learning in any field as far as may be into units for learning, and classifies these into (a) those which are essential for a reasonable competence in that field, and (b) those which represent special accomplishments, valuable intrinsically and perhaps helpful for progress in parts of a, but not imperative. It arranges the units of a in a serial

order such that each helps the others most, and in particular such that a person who has learned units 1 to n to a stated degree of mastery is prepared to learn unit $n + 1$. It provides for each unit diagnostic tests the results of which tell not only how well the learner has mastered the unit on the average, but what particular weaknesses remain. It provides special exercises to remedy any such before progress to the next unit.

Such an organization of the subject matter is possible and desirable for most learning of languages, mathematics, the sciences, including economics, psychology and sociology, and law, and certain features of history, geography, and literature. It is possible and probably desirable in learning many of the useful arts and trades. Less is known about its applicability in the fine arts.

It is especially suited to adult learners who are eager to learn and appreciate a straightforward businesslike system of learning.

CHAPTER XII

METHODS OF TEACHING ADULTS

THIS chapter will not be restricted to recommendations derived from the facts concerning adult interests, but will include any matters which seem likely to be useful.

The teacher is employed to help cause certain desirable changes in pupils and prevent certain undesirable changes. He may help in many different ways. He may tell or show the pupil something. He may provide him with tools to learn by. He may stimulate him to do this, that, and the other. He may reward him or punish him in various ways. He may arrange favorable physical or social conditions for learning. He may supervise activities of many sorts in many ways, militaristic, businesslike, or friendly.

Many of the reforms advocated in teaching are concerned with avoiding narrowness. Teachers are urged to be more than policemen and examiners; more than tellers and demonstrators; more than captains or bosses. Claims are made for supervised study, mutual aid, group discussions and other forms of cooperative work by pupils, the execution of projects of large scope, the correlation of class work with use of the local library, museum, factory, and the like. The facts of individual differences suggest the importance of diagnosis, special remedial treatment where necessary, and educational and vocational guidance by the teacher or somebody. As a protection against too great reliance on educational routines, the role of the teacher as guide, philosopher, and friend is stressed. These suggestions are in the main applicable to the teach-

ing of adults. The teacher there as elsewhere can use a wide range of talents and a wide repertory of means and methods. However, it is not to be expected that teachers should possess all desirable talents in high degree and have mastery of all desirable methods.

A teacher obviously needs to know the persons whom he is to help and the books, apparatus, specimens, objects of art, music and other instruments which are used in helping them.

Knowledge of persons. Knowledge of the persons ranges from knowledge of human nature in general to knowledge of the abilities, interests, and other peculiarities of individual pupils. It may be gained informally by observation and experience or more formally by knowledge of psychology, anthropology, sociology, psychiatry, etc., in the case of general knowledge; and by tests, questionnaires, systemized interviews, and the inspection of records in the case of knowledge of individuals. For full-time education, it is now orthodox doctrine that a cumulative record should be kept for each pupil and that his teacher at any stage should learn the facts about him as a first step toward helping him. It is believed by teachers of adult part-time classes that the individual differences in ability and in interest are greater among their pupils than in regular classes for younger pupils. This is probably often the case, since variability tends to increase with age and since sectioning by ability is not so common in part-time classes.¹ There is then more need for the adaptation of methods to individual needs. In the case of part-time education the teacher should usually at least know the occupation, grade reached before leaving school and age at which it was reached, and main purpose in undertaking adult education, especially the particular

¹ It has been found very helpful in such cases of its trial as have come to the writer's attention, notably at the Bryn Mawr summer school for workers.

enterprise of which the teacher is in charge. What more he needs to know in order to utilize an individual's abilities and experiences for the benefit of all concerned, and to adapt what is done by himself and the other pupils to the nature and needs of that individual, he should learn in so far as he can without neglecting more important duties. There should be no conflict between formal and informal gathering of such information; nor should the use of formal means decrease the friendly human interest in one's pupils. It is customary for teachers to use free class discussion of topics studied and of their applications to everyday affairs as a means of becoming acquainted with their pupils and of acquainting the group with each member. This is doubtless often desirable, but there is danger of undue prominence of the superior, the glib, and the litigious student, and of undue expense of time for the benefits attained. It would seem that with sufficient ingenuity, each pupil could be assigned something special to do, in the early meetings, which would serve this purpose and also the general purposes of the course better. For example, suppose that thirty men and women workers are to learn the fundamentals of economics and that the teacher has already a record of the occupation, grade reached at age ———, and alleged purpose in undertaking this study. Suppose that at the first meeting the teacher presents the topic, "Ways of Earning a Living." The five presumably dullest could well be given some fool-proof assignments, such as to examine four statements of a certain matter (all being good ones), and choose the one they like best, and read it to the class. Five who come from remote localities could well be asked to report on any strange ways of earning a living in their neighborhoods, and on the most common occupations. Five presumably bright pupils could be asked to represent a teacher, a clergyman, a home-maker, a United States Senator, and a pawn-broker and defend the proposition,

"I earn a living by helping to satisfy people's wants." Each person including the teacher would introduce himself by "My name is _____. I am from _____, a city (town, village) in the State of _____. I have worked as _____. My present job is _____."

Knowledge of the instruments used. We are not here concerned with the obvious fact that a teacher should know the subject that he teaches, but with the much less appreciated fact that he should know the plan and method of every instrument used. A good text-book, for example, usually has reasons for what it does and when it does it. Teachers often do very great damage by omitting parts of the work, replacing parts, and displacing parts. An instrument for learning a science or a language (for example, an arithmetic, or first-year Latin book, or manual of chemistry or economics) should be an organic unitary total. The teacher using it should study its plan and be certain that nothing which he does interferes with it.

The same is true, though less emphatically, of text-books in history, geography, literature and the arts.

The most common error of method in teaching adults is to assign too much and to expect more rapid learning than is possible for the students concerned. Clerks and mechanics, tired after a day's work, are asked to do more per hour than high-school students for whom learning is the main job. Adults unused to holding their minds to a theory, or argument, or system of facts, or array of evidence, are expected to understand, remember, organize and use a lecture or discussion or combination of the two, although when they were in best training for such work, they would have understood less than two-thirds of it, remembered less than one-third, and been able to organize and use less than a sixth.

Another common error is to provide them with important generalizations and broad sweeping statements without the detailed facts, illustrations and applications

which make the generalizations and sweeping statements comprehensible, vital and memorable, and insure them against mistake and misuse.

It is partly the failure, as a consequence of these errors, to help adults really to learn anything of consequence, which has led to the defeatist doctrine that we must not expect adult learners to acquire knowledge or power, that examinations should not be used, that if they spend pleasant hours in company with a sympathetic teacher, hearing his views and expressing their own, all is well.

Adults can learn. To help them to do so the teacher should use the methods for teaching human beings of any age to form generalizations and abstractions, to get real values from pictures, descriptions, maps, graphs, etc., to understand terms, definitions and rules, to remember facts and principles, to apply all in solving problems. These are presented in standard books on teaching.

In addition to such stock features of general pedagogy, certain facts revealed by recent investigations of learning may be briefly noted:—

FAMILIARITY

It is often useful for the learner to acquire a familiarity with the existence of the thing to be learned before he tries learn it. So, for example, a child may be familiarized with the expressions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{8}$ and $\frac{3}{8}$ as the sizes in inches of chisel-blades, or the widths in yards of banners and badges, before he learns their arithmetical properties. There is reason to believe that a person who sees many people driving automobiles, even though he does not think at all about what they do, will learn more quickly than if he had been the first man to drive one. Nor is it a waste of time for the learner to feel of the wheel, poke the clutch in and out, and in general become at home in the driving seat. To spend the first two hours in learning thirty Latin nouns as the teacher shows pictures of the

objects with the name beneath and pronounces the words, has some worth as a first step in vocabulary, but also by giving the learner who lacks it a sense that there is a Latin language, that people learn it, that it will not harm one.

An introductory chapter or lecture giving a general description of chemistry or psychology or the middle ages is not wasted even though it may do little more for the duller half of a class than to give them a vague familiarity with facts and terms.

UNDERSTANDING

Soon after, or along with familiarity, should come understanding. And this is where the teaching of adults, especially teaching by lectures and discussions, often fails. The process of understanding even a fairly simple sequence of sentences which present anything not already known really involves all the difficulties of reasoning and is comparable to solving a novel problem in arithmetic or an original in geometry. It is no mean task to take in what the lecture or chapter or discussion gives.¹ Many students are estopped from remembering, organizing, and using it because they have not even understood it.

RETENTION

The next hurdle is remembering. Certain things have to be held or remembered if certain new things are to be done or understood. For example, in modern methods of teaching a person to swim he is first taught to be undisturbed by having his feet off the ground and supported by nothing save water. If he fails to retain this and relapses into the natural tendency to reach out from the water to grab something or somebody, or to reach down to some-

¹ Evidence of these facts may be found by using the material of Appendix VII, which will also reveal to a teacher what the level of ability of each person in his class is.

thing solid with his feet, he cannot progress. Unless a person remembers that "6% of" means $.06 \times$, "4% of" means $.04 \times$, etc., he cannot well progress with anything further about percentage. The reader of a history must at least remember what person or nation it is the history of. A feature of effective method is the provision of enough practise (preferably in the form of intrinsically valuable exercises) to fix what needs to be fixed. If this practise can be had equally well through informal, varied, agreeable, sociable activities rather than by formal drill and quizzes, so much the better. Such practise is not subversive of organizing, relating and applying knowledge, skill or taste, but their great assistant. A pupil cannot organize, relate or use something until he has it.

ORGANIZATION AND USE

Methods of organizing, relating and applying have been developed to a high degree in the teaching of the elements of reading, mathematics, and foreign languages;¹ and experts in the teaching of the natural and social sciences are making progress in that direction.

It is a harder and more delicate task to combine abilities into abilities of a higher order than to acquire them each by itself; to see the relations of facts and principles than to understand only their constitution; to select from one's repertory what is applicable to a question or task and apply it properly than to develop and maintain the repertory. Higher ability is required in the learner to do these, and much greater skill in the teacher to help him in doing them. Simon Newcomb was of the opinion that problem solving in arithmetic should *not* be taught. He would spend the time and energy available in teaching the arithmetical facts and principles, leaving it to the pupil's

¹ Let the reader compare Gates' books for teaching reading in Grades 1 to 3, Nunn's Algebra, and Michael West's texts in English for foreigners with the books in use a generation ago.

native wit to apply them. And if training in problem solving consisted merely of assigning an indiscriminate lot of problems, as it did in his day, he would perhaps be right. They were tests of intelligence rather than training in the use of abilities.

Much care and ingenuity is required to help pupils to develop integrated and available abilities rather than knowledge of the pedantic sort and stereotyped habits and skills. A study of what is done in the best text-books will be of benefit. Also it is of some benefit to realize that abilities are not organized merely by writing reports, that facts are not put in vital relations merely by discussing them together, that abilities do not form abilities of a higher order merely by being practised together, that mere assignment of problems to be solved does not improve the ability to solve them. Perhaps it is not impertinent to warn teachers of adults that, in spite of common practises, little can be expected from loose "discussions of practical problems," and still less from pretended solutions of problems the answers to which experts do not know.

THE PROJECT METHOD

Much use, good and bad, is now being made of the so-called "project method" in teaching at all levels. Its eminent advocates mean many things by it, and their followers do almost anything under its banner. For our present purpose consider these propositions: —

Projects, in the sense of enterprises of considerable scope and requiring considerable amounts of time (say from 5 to 50 hours), are often desirable as a relief from too much learning in dribblets, line upon line, precept upon precept, ten examples a day, five words to spell, read 50 lines of Vergil, and the like.

When such a project commands the interest of the pupil, he learns what he needs to learn to execute it in a healthy,

reasonable way, with a purpose; his gain in knowledge, and skill, etc., may be greater per unit of time spent than if he studied those matters apart from the project; the knowledge, skill, etc., are more likely to function in his life later since they did actually function in the project.

Even when learning in connection with a project is no more interesting to a pupil than the same learning apart from the project, the increased probability of later functioning will hold to some degree; what is learned for use being more likely to be usable than what is merely learned, even if there is no greater interest in the use than in the learning.

According to these propositions, which seem reasonable, projects are beneficial by increasing interest and making learning purposive and serviceable. They may, however, take more time than they are worth.¹

More mystical virtues are claimed for the project method by some who allege that it is the natural way to learn, or that it enlists more of the learner's total personality, or that activity in executing a cherished project has a special fertility and progressive quality. I find no warrant for these claims in the psychology of learning or elsewhere.

Adults who are being taught by their own choice what they wish to learn for some genuine purpose of their own,

¹ The best case of the use of the project method in part-time adult classes which has come to the writer's attention is the following reported by Cole: "In a class on current industrial problems, the topic was the conditions governing the adjustment of wages. The class was led to form itself into a tribunal for hearing a case which was actually troubling the industrial world. Certain members were assigned to sit as a Railway Wages Tribunal to hear the case, and of these some were supposed to be representatives of the workers and some of the employers, while one student assumed the position of impartial chairman; other members were appointed to argue the case, some on behalf of the trade unions and some on behalf of the railroad companies; each person concerned had to prepare his own brief and not only to argue the case in the imaginary court, but also to submit his case as a piece of written work." (Cole, G. D. H., '33. "The Tutorial Class in British Working-Class." *International Quarterly of Adult Education*, Vol. 1, pp. 127-148.)

have the essentials of a project. Certainly the elements of indirection, cajolery, and hoodwinking pupils into learning something when they think they are doing something else, which sometimes characterizes the project method as used for children, are out of place in most teaching of adults. Projects undertaken merely to increase interest seem more appropriate as subsidiary recreatory features than as the staple method of learning. They have been so used for generations. A good instance from early Chautauqua days is of a group who had been studying geology and gave a geological tea-party. I quote the account from p. 608 of the *Chautauquan* of 1888-1889:

"In October 188— a merry party of ten took possession of the Rip Van Winkle Inn at the Catskills. The house was owned by one of the number and after the summer tenant had departed we were invited to take possession. We had the historic old place all to ourselves, and kept house in true Bohemian fashion. While there, our Chautauqua books were sent us, and eight of us commenced reading the geology, a most delightful book. After returning to our homes we held a Geological Tea Party. The invitations read: 'Three little cobbles of the Catskills group send compliments to the three sandstone bowlders, and beg they will drift down and fuse them in a conglomerate on Monday afternoon at five o'clock. Ground swells will run in paleozoic time and will bear them home by torrential action, though it is hoped there will be no moraine. Mollusk, Silicate and Belem-mite.'

"We presented ourselves, highly decorated for the occasion, —hammers, chisels, etc., on our belts, and sea horses and strings of shells in our hair. One wore a lava pin at her throat, another hung on her wrists bracelets of crinoids. Chautauqua questions were asked and answered, a chapter from the geology read, and specimens inspected. The center piece of the tea-table was an improvised volcano made of stone and fine pebbles, forming around a cone dexterously hidden from view. It was supposed to be a Catskill volcano. At each plate lay a small slate on which was written the menu. Among the novelties which graced it were: Bowlders, conglomerate — croquettes. Emeralds in solution,— potatoes stewed in milk. Wheaten Uplift with anticlinal crust, — bread. Native gold, (18 carats) —

butter. Currents from the Red Sea, — jelly. Quartz of still water from the Catskill Geyser, holding fish in solution, — water from the reservoir. Freestones, very gneiss, — canned peaches. Stratified formation, with horizontal cleavage, — chocolate cake in layers. — Limburgite, — cheese. Water in tumultuous action, containing buried treasures, — coffee. Detritus from sugar loaf, — sugar. Eozoic ooze and other drift, — milk.

“Everything was delicious and served in daintiest fashion, though the volcano winked and blinked and went to sleep. The ground swells were used in getting the company home.”

The educators of the time did not suggest that such projects be used to teach geology or develop anybody's personality. Indeed, they seemed to view this as a means, not of making geology interesting, but of making a tea-party interesting by geology.

FREING INTEREST FROM NEEDLESS BURDENS

It is good policy for a teacher to utilize the interests already present before spending time in trying to create interests. This implies that the available interests should not be thwarted by unnecessary burdens. If you wish a pupil to read a certain book, you can at least make sure that he has easy access to it and a good light to read by. If you wish him to understand a book, you can at least make sure that the words in it are not beyond his comprehension. Material which you give him to study can at least be given to him in clearly mimeographed sheets with suitable arrangement and spacing. He should rarely have to copy it from dictation or from a blackboard. A lecturer can at least speak so that his words can be heard without strain, and require those who contribute to discussions to do the same. We can often help learning simply by remedying conditions which prevent it, hamper it, or deprive it of satisfyingness. The most precious interest available is the interest in learning. It is suicidal to choke it off by assigning tasks beyond the learner's

capacity; or to thwart it by dragging him away to a new task when he is just beginning to enjoy progress and mastery in his first task; or to leave it unrewarded by never letting the learner measure his progress by suitable tests; or to punish it by making those who have learned listen in boredom to teaching which helps only those who have not.

AVOIDING PRACTISE IN ERROR

Recent experiments in learning by adults have shown that a wrong response to a situation tends to establish a wrong habit even though that response is immediately pronounced wrong and punished. The learning of a person who mistranslates a phrase, or misspells a word, or harbors a wrong notion, or hits the wrong key on a typewriter, or makes a wrong movement in dancing or swimming, suffers therefrom, even if he is immediately informed of the fact. If he is permitted to regard his behavior as satisfactory, his learning suffers much more. The experiments in question prove that we learn little from our mistakes and failures except in so far as the mistake or failure leads us to do the right thing instead. What we really learn from are our right responses and successes.

These facts emphasize the avoidance of "practise in error" as a chief factor in good teaching. They should destroy or at least change radically three doctrines which have been widely prevalent. The first is that punishing undesirable tendencies is a sure means of weakening them. The second is that a satisfactory way to secure proficiency is to let the learner "try, try again," rewarding his successes and punishing his errors. The third is that active discovery by the learner is so enormously superior to passive acceptance by him as to justify a very large proportion of error to a small amount of discovery.

The truth concerning the first is that punishment, though beneficial in certain ways under certain conditions,

is a risky, undependable, precarious force. The truth concerning the second is that learning by undirected trial by the learner plus selection by the teacher is satisfactory only when we are grossly ignorant of useful ways and means of directing the learner's trials, or prejudiced in favor of useless or harmful ways. Thirty years ago something of the sort was true of swimming, but no well-informed teacher of swimming would now let a child flounder about in the water. In the case of systems of teaching handwriting devised by ignorant men, pupils have perhaps been hindered more than helped by the directions given to their efforts. But impartial scientific study of the matter should enable us to predispose and direct learners to their advantage. The truth concerning the third is that active discovery and passive acceptance are both good, each in its place and with all relevant circumstances and consequences given proper consideration. A Frenchman learning English might reasonably be left to "discover" or infer that *horse-doctor* meant a person who acted as a doctor for horses and not a horse who acted as a doctor for persons, but it would be folly to have him try to discover what *oak*, *beech*, *four* and *five* mean. Knowing the meaning of a^2 , a^3 , a^4 , a^5 a learner may be urged to discover what a^6 , and a^7 probably mean; if he is a very gifted person, he may be urged to discover whether a means a^0 or a^1 , and possibly to risk inferences concerning a^{-1} , a^{-2} , a^{-3} , a^{-4} , a^{-5} , a^0 , $a^{1/2}$, $a^{1/3}$, $a^{1/4}$ and $a^{1/5}$. If he is an ordinary person, it will be more profitable for him to accept the facts that $a = a^1$, $a^{-1} = \frac{1}{a}$, $a^{-2} = \frac{1}{a^2}$, $a^{-3} = \frac{1}{a^3}$, $a^{1/2} =$ the number which multiplied by itself $= a$, $a^{1/3} =$ the number such that $a^{1/3} \times a^{1/3} \times a^{1/3} = a$, and that $a^0 = 1$, and to use these facts to discover others. Two of the very important relevant circumstances are the amount of time the discovery will require and the probability that it will be correct. One of the very important consequences of

passive acceptance is that it often makes possible a greater total amount of active discovery. Often the more the learner has given to him, the more he can, then and later, get for himself. The discoverers par excellence take pains to learn all they can by acceptance. Newton, Darwin, Einstein, Dante, Milton and the Bachs received gladly what their predecessors had to offer them.

The teacher of adults will then be as careful to provide for useful acceptance as for useful discovery. He will eagerly guide learning in the ways in which it should go, and also be constantly on the watch for opportunities for choices, inferences, experimentation, and other active enterprises that are instructive or otherwise profitable. He will reward both sorts of learning. He will take it as a danger-signal whenever the learner goes wrong and will try to prevent mistakes except such as are demonstrably productive of good, or necessary adjuncts to some good. He will discard as popular pedagogical superstitions the notions that if pupils are led to think it matters little what they think, and that if they are led to try it matters little how they succeed.

THE TEACHER-PUPIL RELATION

By law or by custom teachers have usually been responsible for what pupils learn and for the management of class-room procedure. The teacher has been oracle and monarch. Teachers consequently tend to acquire an air of authority, of superiority, not to say omniscience, and of condescension toward their pupils. This is objectionable to many pupils, young and old. Boys and girls in high school and college may appreciate the fact that in the matters concerned the "prof. does know his stuff" and that they do not, and so may for the purposes of the class be submissive and enjoy being so. Or, though resenting the teacher's domination, they may become more or less hardened to it and defend their personal dignity by

putting teachers in a class apart as persons who exercise authority in school but would lack it elsewhere, being weak in masculine vigor and feminine charm, and in general the opposite of money-makers and movie-stars. Adult learners are perhaps especially sensitive to it because they already have to endure more domination in the factory or office than they can tolerate. Also when one pays his own money rather than his father's for instruction, he may naturally feel more right to be catered to as a part-owner in the class.

At all events, a majority of those who have the welfare of adult education at heart think that the teacher should shift from the attitude of master toward that of friend — that he should not parade his superiority even in the particulars which he has been chosen to teach because he is superior in them, that a democratic rather than monarchical system of class management should be used so far as is consistent with the progress and enjoyment of the group, and that in doubtful cases the teacher should err in the direction of consideration for the feelings of the pupils.

These facts have an influence upon methods of teaching. If the customary conventions that a pupil in a class takes the teacher's official statements about the thing to be learned as true unless he has good reason to believe the contrary, and follows his directions in learning it unless he has good reason to do otherwise, are abandoned, the teacher may be tempted to act like a preacher or salesman rather than a professional expert.

Effective methods in evangelism and in selling are surely not those which should be chosen for ordinary teaching. The simple doctrine that the teacher's business is to help pupils to learn with a reasonable regard for all other desirables, lets him be an oracle, monarch, foreman, friend, servant, executive-officer, or whatever best fits the learners and their learning, and to use methods in accordance

with his temporary status. What restrictions upon methods will result if he must favor a certain egalitarian status, and even approximate the doctrine that "the customer is always right," are not altogether clear. Probably the teacher can operate in accord with the simple doctrine without difficulty, if he states to his pupils at the outset that his job is to help them learn, that he will do the best he can, that he will be glad of criticism from them, and perhaps that he wishes them to elect or choose by lot two committees, one to receive written criticisms or complaints from any member of the class concerning anything the teacher or any member of the class does which seems to hinder learning, the other to receive written criticism or complaints from any member of the class concerning anything which the teacher or any member of the class does which seems to reduce the general enjoyment of the work. It may also be wise to indulge the innocent love of office-holding by having each member of the class act as presiding-officer in turn, and by having officers or committees elected to attend to the circulation of books and magazines, the invitation of special speakers, the planning of excursions, social meetings, and the like, and whatever else committees can enjoy doing with or without help from the teacher. People in general like to feel that they are in power, but, that being granted, do not interfere with a competent leader.

LECTURES AND DISCUSSIONS

The question most commonly referred to in discussions of methods of teaching adults concerns the respective merits of lectures and discussions, and the answer most commonly given is that a combination of the two is best, especially if the teacher is skillful in managing the discussion. The term discussion is used, however, in a great variety of meanings, including (1) questions and answers in cases where pupils need restatements, (2) explanations

and illustrations, (3) arguments, (4) the presentation of evidence, (5) questioning by the teacher to check the acquisitions of pupils, (6) special contributions of individual pupils or committees from their personal experience or study, (7) arrangements whereby the class is divided for discussion into a panel of principals and an audience with less responsibility, and still other schemes, which have little in common except that persons talk, and are supposed to talk about the topic of the day.

It seems probable that if the teacher's rule is our simple one of using the formal class meetings in such ways as to help the students learn what they need to learn, the amount of time given to lecturing by the teacher will be greatly reduced, since it is incredible that his presentation of a topic in a lecture should very often be superior to all the presentations available in print. The amount of time given the sort of discussion usually heard in classes will also, by the same rule, be greatly reduced, since it is incredible that the ideas which come to mind in the general run of students in the general run of talking about a topic extemporaneously, should very often be superior to the ideas which could be gleaned from the deliberate expressions of various persons who have discussed the topic in print.

Many college teachers know well that they would help their students more by reading well-chosen quotations to them than by giving even a well-prepared lecture of their own, and do the latter only because the former seems to be shirking a conventional duty and earning their pay too easily! Many students know well that what they themselves say and what they hear others say is less instructive per minute of time spent than hearing or reading the printed discussions of people who have important material to contribute; they talk because they like to talk, or fear they will be thought dumb if they say nothing, or wish to do their share. They listen to others out of personal in-

terest, or because there is nothing better to do. If there were a choice between (1) attendance upon a discussion, (2) taking a test with a key so that one can at once see just how well he did, (3) seeing an educational movie that presented or illustrated the topic, (4) examining a hundred pictures giving new material on the topic, (5) making something expressing one's mastery of the topic, (6) doing an instructive experiment, (7) hearing the views of a dozen leaders upon the topic, and (8) hearing a sort of catechism in which the commonly asked questions about the topic were listed and followed by "yes," "no," "not known," "probably so and so," etc., there would certainly not be unanimity in favor of the discussion.

The greatest utility in discussions by members of adult classes would seem usually to be in statements, often prepared in advance, of instructive experiences of one's own, or of one's friends and acquaintances. The next greatest would seem to be in statements of problems, of one's own or of one's friends and acquaintances. The solutions to these, in cases where a solution can be found that is certainly right or has a sufficient probability of being right to justify acting upon it, may be worked out by the class; or the way to find the solution may be told to them; or the solution may be given to them by the teacher, — as seems most desirable. Next in value may be put requests for explanations of things not understood and of apparent inconsistencies or inadequacies, and objections, though statements of all these may often be more valuable when put in writing (signed or unsigned, as the person prefers) than orally.

MINOR PROBLEMS OF METHOD

Adult learners are often held back by self-consciousness. A teacher gifted at putting people at their ease will handle such cases as the occasion demands by intuition. Those of us who are not so gifted may profit by assigning work

which pupils can do without being observed by others, and can check and correct with the aid of keys. Such is found in many text-books, in the so-called "Work-books" now widely used in elementary education, and in the objective tests now available in almost all fields. We may also utilize the method of supervised study and the prepared recitation or discussion in which the contribution of each pupil is validated by the teacher before it is presented to the class. Where movements are to be taught the teacher may face away from the class so that they are not under inspection. It is also then easier for them to imitate the movement, since no right-left front-back reversals are involved.

Indoctrination by traditional proverbs and customs or unfortunate experiences in trying to learn too hard things or at too rapid a rate produce a defeatist attitude in many adults. They do not try to learn because they expect to fail; if they do try, they are hampered by worry and fear. This may be remedied by a graphic account of the achievements of adult groups, a clear and emphatic statement of the rate of learning the task in question found in the early 'teens and expected of them, and the use of a large factor of safety in the amount and difficulty of the learning at the start of any course. Some adults are disturbed because they do not learn the meaning of a word in five or six repetitions, and do not understand a paragraph at the first or second reading. Some of the students in working men's classes in England were discouraged because they could not write reports on their reading equal in formal correctness, style and interest to magazine articles! They were greatly comforted at being told what was really expected of them.

Some adults on the other hand have been misled by false advertisements or advice into an unwarranted optimism and expectation that by attending such and such meetings or reading such and such text-books for a dozen

or so hours they will be transformed almost miraculously. They do not try to learn, because they expect learning to fall upon them from the instructor or book as manna fell from heaven. Many of them probably do not belong in the courses they try to enter. Those who do have the ability and interest, suffering only from this minimizing of the difficulties, may be cured of it by a test on the work of the first meeting at its close and repeated at the beginning of the next meeting, and similar tests for the work of the second, third, and fourth meetings.

It is customary to devote the first of a series of class meetings to formal matters of registration and announcements, and to a general description of the aims and content of the course as a whole.

It seems desirable to use the routine of registration to make the class mutually acquainted in a friendly way and to make the teacher acquainted with them and supplied with important facts about each of them. To do this without undue expenditure of time requires forethought and skill.

It is desirable to use the routine of announcements to illustrate the personality of the teacher, his attitude toward the work and the class, and his ability to be clear, orderly, and businesslike. Many a teacher who is conscientious and ingenious in preparing for and presenting the content of a course later, is careless and clumsy in the routine announcements of the first day. He thus makes an unfavorable impression which is unfair to himself and to the class.

There is something to be said for abbreviating, or even omitting, the general description of the course, so as to have time to show what the work will be like by actually doing the first unit of it. A sample gives a more vivid and honest idea of a total than a description. It also enables the students to see whether they are able to do what is required of them.

METHODS IN CLASSES WITHOUT A TEACHER

Discussions of methods in part-time adult classes almost without exception assume that the work is carried on by a person, the teacher. The tradition of education by a person is so strong that even those enthusiasts for democratic group discussion who insist that the teacher shall exercise no authority and that the group must teach itself, still assume that there must be a teacher!

There have been at least two great experiments with teacherless schools, the Chautauqua Literary and Scientific Circles of this country and the Study Circles of Sweden. Both were in many respects highly successful but the CLSC classes waned, and the Swedish Study Circles are, I understand, using teachers increasingly. There is now much semi-impersonal teaching by radio.

The possibilities of learning with guidance from printed directions or radio talks, or both, deserve careful study and experimentation. The teacher of old who assigned lessons and heard recitations was chiefly an inciter to work, maintainer of order, planner, and examiner. The first two of these functions should be needless in most adult part-time classes, and the last two can often be done better by a series of exercises and tests without a teacher than by the average teacher without the exercises and tests. Pressey, Lorge, and perhaps others are devising *machines* to teach and test. In cases where the cost of a teacher prevents the provision of suitable text-books, work-books, tests, reference library and the like, it may often be better to have a part-time teacher plus proper facilities, by having one teacher for two classes.

It surely is desirable to find out what can be done without a person, so as to save the expensive personal service to use where it is most useful. Methods of teaching without a teacher may turn out to be more flexible, humane and inspiring than anybody would now suppose.

The reader may profitably read Chapter XIII of *The Cosmopolitan Evening School* by J. F. Fries (1929), and Part III, Sections 2, 3, 5, and 6 and Part 4, Sections 3, 4, 5, 6, and 7 of *Adult Education, a Report of the Subcommittee of the American Vocational Association*, December, 1927 (found conveniently as Appendix A of Fries' book) to obtain knowledge of the opinions of some of those who have taught in adult part-time classes concerning the methods which should be used. He may also profitably read *Adult Immigrant Education* by W. Sharlip and A. A. Owens (1925), to see a reasonable and practicable consideration of adult interests and abilities in one important special case. Chapter 9 of *The University Afield* by A. L. Hall-Quest (1926) gives an interesting account of methods under the restricted conditions of correspondence courses. Chapters 7 and 8 (pages 167 to 256) of *University Teaching by Mail* by W. S. Bittner and H. F. Mallory (1933) present both a general account and special descriptions of methods used in typical subjects (Biology, Education, English, German, History, Mathematics, Mechanical Drawing, Graphics, Strength of Materials, Psychology and Sociology). *Discussion Methods for Adult Groups* by Thomas Fansler (1934) presents selected stenographic reports of discussions of various types led by experts, and sagacious sympathetic criticism thereof. These five books will supply the more important items omitted from this chapter and serve as an antidote or counter-irritant to its heresies.

APPENDICES

APPENDIX I

DATA ON CHANGES IN INTERESTS

IN interpreting the changes in interest reported, it is desirable to have in mind the status at age 20-29. No. 17 (sheer idleness, doing nothing and thinking of nothing) was disliked by nine-tenths of the persons and very much disliked by half of them. Each of the sixteen activities listed is on the whole rather emphatically liked. The facts in detail are presented in Table 3 on pages 95-8 for six groups (clergymen, men teachers, business men and lawyers who were college graduates, business men who were not college graduates, psychologists, and women teachers), and in Table 6 for the thirty men engaged in factory work, farming, skilled labor, clerical work and small business. They are summarized in Table 7.

TABLE 6

Reported frequencies of each degree of liking for various activities at age 20-29 for 30 men engaged in factory work, skilled labor, clerical work and the management of small businesses.

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
1. Read fiction					1	2	7	2	4	6	8
2. Read non-fiction				1	2	7	4	4	6	1	4
3. Read newspaper				1		1	2	3	1		22
4. Sports						4	2	1	3	1	19
5. Outdoor games			1			11	4	4	2		8
6. Sedentary games			1			8	2	6	4		9
7. Dancing						15		1			
8. Music (play)			1			20	3	2			4
9. Music (listen)										1	29
10. Theatre, movies						5	3				22
11. Regular job			1		1		4	2		2	20
12. Politics			1		2	23	1		1		2
13. Welfare work					1	24	3		1		1
14. Talk with old friends . .						1	1				28
15. Make new acquaintances .								2			28
16. Travel and sight-seeing .						2	2		1	1	24
17. Idleness	25		1					4			

TABLE 7

The general status of interests at 20-29

ACTIVITY	MEDIAN RATINGS				PERCENTS REPORTING				LIKING Cases of Table 3	LIKING Cases of Table 6
	122 Cases of Table 3 ¹	30 Cases of Table 6 ¹	152 Cases of Both	DISLIKE 122 Cases of Table 3	INDIFFERENCE 122 Cases of Table 3	INDIFFERENCE 30 Cases of Table 6	INDIFFERENCE 30 Cases of Table 6			
1. Read fiction	+ 3.5	+ 2.5	+ 3.0	2.5	3.3	3.3	23	23	94.3	67
2. Read non-fiction	+ 3.0	+ 1.5	+ 3.0	4.9	0.8	0.8	23	23	94.3	64
3. Read newspaper	+ 2.0	+ 5.0	+ 2.5	4.1	7.4	7.4	3	3	88.5	94
4. Sports	+ 3.5	+ 4.5	+ 3.5	6.7	7.5	7.5	13	13	85.8	87
5. Outdoor games	+ 2.5	+ 1.5	+ 2.0	16.7	12.4	12.4	37	37	70.9	60
6. Sedentary games	+ 1.5	+ 2.0	+ 1.5	15.6	10.7	10.7	27	27	73.7	70
7. Dancing	+ 1.5	+ 1.0	+ 1.5	26.9	12.0	12.0	50	50	61.1	50
8. Music (play)	+ 0.5	0	0	17.4	25.7	25.7	67	67	56.9	30
9. Music (listen)	+ 3.5	+ 5.0	+ 4.0	3.3	2.5	2.5	0	0	94.3	100
10. Theatre or movies	+ 3.5	+ 5.0	+ 3.5	2.5	5.7	5.7	17	17	91.8	83
11. Regular job	+ 4.0	+ 5.0	+ 4.0	4.1	1.6	1.6	0	0	94.3	93
12. Politics	+ 0.5	0	+ 0.5	18.3	30.0	30.0	77	77	51.7	13
13. Welfare work	+ 1.5	0	+ 1.0	14.2	35.0	35.0	80	80	50.8	17
14. Talk with old friends	+ 3.0	+ 5.0	+ 3.5	0.8	3.3	3.3	3	3	95.9	87
15. Make new acquaintances	+ 2.5	+ 5.0	+ 3.0	12.4	5.8	5.8	0	0	81.8	100
16. Travel and sight-seeing	+ 4.0	+ 5.0	+ 4.5	1.7	0	0	7	7	98.3	93
17. Idleness	- 3.5	- 5.0	- 4.0	81.6	9.2	9.2	0	0	9.2	13

¹ See pp. 95 and 163.

The median ratings for Items 1 to 16 run from 0 for Politics to about +4 for Listening to music, My regular job and Traveling and seeing new places. Playing a musical instrument and Welfare work are next to Politics; Sedentary games and Dancing are next lowest. Outdoor sports, Theatre or Movies, and Talking with old friends, rank high. Reading of the various sorts and Making new acquaintances are intermediate.

If a person's liking really increased from the twenties to the fifties his record could not show it if he was already in the +5 class at 20-29. If his dislike really increased from the twenties to the fifties his record could not show it if he was already in the -5 class at 20-29. There are many ratings of +5 at age 20-29, and very, very few of -5. Consequently there is a much greater chance of zero changes from +5 +5 records when there was really an increase of liking than of zero changes from -5 -5 records when there was really an increase of dislike. The error from undistributed ratings at +5 and -5 thus on the whole works as a factor of safety to our conclusions in Chapter II.

The facts in detail for the changes for age 20-29 to age 50-59 appear in Table 8. They include the facts summarized in Chapter II, and also the facts for a small group of physicians, and for a small group of married women, graduates of colleges or normal schools who were homemakers during most of their adult lives. The great frequency of 0 changes in the group of thirty non-college men who were factory workers, clerical workers, etc., is due to their frequent use of -5, 0, and +5 in their ratings. Some of the extreme changes (such as the one of -10 and the one of +10) may be due to carelessness in attaching signs to the ratings.

TABLE 8

The frequency of each degree of reported change in the case of each activity in each of the following groups:

Cc	College graduates, ministers.	n = 20
Ct	College graduates, teachers.	n = 38
CPsy	College graduates, psychologists.	n = 20
Cp	College graduates, physicians.	n = 8
Cbl	College graduates, business and law.	n = 20
Nb	Men immigrants, or sons of immigrants, skilled workmen, owners of small businesses, or retired.	n = 23
Nf	Men engaged in factory work, farm work, skilled trades, clerical work, etc., in a small town.	n = 30
Wt	Women college or normal school graduates.	Teachers. n = 20
Wh	Women college or normal school graduates.	Home-makers. n = 8
1. Read fiction	-10 -9 -8 -7 -6 -5 -4 -3 -2 -1	0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10 Omit- ted
Cc.....	.. .. .	8 1 1 .. 1
Ct.....	.. .. .	3 6 3
CPsy.....	.. .. .	4 10 9 5 2 3
Cp.....	.. .. .	4 5 7 2 1
Cbl.....	.. .. .	1 1 4 1 1
Nb.....	.. .. .	1 2 5 4 6 1 1
Nf.....	.. .. .	1 3 1 7 8 1 1 1 1
Wt.....	.. .. .	1 20 1 1 1 1 1
Wh.....	.. .. .	4 2 2 9 2 1
	.. .. .	1 2 3
2. Read non-fiction		
Cc.....	.. .. .	9 5 1 3 2
Ct.....	.. .. .	17 11 5 1 .. 1
CPsy.....	.. .. .	1 9 8 1 .. 1
Cp.....	.. .. .	4 3 1
Cbl.....	.. .. .	9 6 1 1
Nb.....	.. .. .	11 3
Nf.....	.. .. .	20 .. 1 .. 1 1
Wt.....	.. .. .	5 3 3 4 1 .. 1 1
Wh.....	.. .. .	4 1 2 1

[illegible]

15. Make new ac-
quantances

	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10	Omit- ted
Cc.....	1	..	2	..	5	2	9	5	3	1							
Ct.....	1	..	2	..	5	2	15	7	1	2							
CPsy.....	1	6	1	11	..	..	..	1	..	..	..	..	..	1
Cp.....	1	1	6	..	..	1							
Cbl.....	3	4	11	11	..	1	1							
Nb.....	1	1	4	4	4	7	1	1	..	1							
Nf.....	1	1	27	..	..	..	1							
Wt.....	2	2	4	11	..	..	..	..	1						
Wh.....	1	..	..	1	4	..	..	1	1							

16. Travel and sight-
seeing

	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10	Omit- ted
Cc.....	3	11	4	1	1	1	..	..	..	..	..	..	1
Ct.....	1	..	..	3	1	6	17	6	1	1	1	..	..	..	..	..	..	1
CPsy.....	2	1	3	12	1	..	..	..	..	..	..	..	..	..	1
Cp.....	2	..	4	1	..	1	..	..	..	..	..	..	..	1
Cbl.....	2	..	2	14	1	1	1	1							
Nb.....	1	1	1	..	3	4	9	3	..	..	1							
Nf.....	2	2	1	..	..	24	..	..	..	..	1						
Wt.....	1	2	1	12	2	1	..	1							
Wh.....	2	1	3	1	1	1	1							

17. Idleness

	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10	Omit- ted
Cc.....	1	..	1	3	14	1										
Ct.....	2	2	30	2	..	1	1	..	..	..	..	..	..	1
CPsy.....	1	..	..	..	1	4	10	3	1	1	1							
Cp.....	7	..	..	1	..							
Cbl.....	2	2	14	..	2	..	2								
Nb.....	1	5	10	4	3	..	..	1	..	..	1	..	1		
Nf.....	1	..	..	..	26	..	..	..	..	..	..	..	..	..	..	2
Wt.....	1	1	1	1	12	3	..	..	1							
Wh.....	7	..	..	..	..			

APPENDIX II

DATA ON THE INFLUENCE OF FREQUENCY OF REWARDS¹

It is a matter of common knowledge that a mind which for any reason becomes engaged in an activity and finds itself repeatedly and persistently failing therein, is impelled to intermit or abandon it. The person does abandon it unless this impulsion is counterbalanced by some contrary force, such as the hope of a turn in the tide toward success, or an inner sense of worth from maintaining the activity, or a fear that worse will befall him if he stops.

It seems probable that during a long unrewarded activity when abandonment or overt intermission is not permissible, the mind will tend to relax its efforts and do work less in quantity, or lower in quality, or inferior in both. And we have sought to discover whether this is true, and, in particular, whether it is beyond ordinary voluntary control. The experiments to this end are all of the following nature: The subject is required to do his best with a long series of tasks (three hundred sixty or more) upon each of which he is to spend five seconds (or seven and one-half or ten seconds, in some of the experiments). Each series consists of (A) groups of five consecutive tasks, each group such that the subject will certainly do one and will average two or three, and (B) groups of fifty or one hundred consecutive tasks of three sorts. In *B1* none or only a very small percentage of the tasks can be accomplished within the time allowed. In *B2* the percentage of the fifty or one hundred that can be accomplished is larger. In *B3* the percentage is much larger.

We compare the work done at an *A* group of five tasks follow-

¹ This appendix presents findings reported more fully in an article in the *Journal of Educational Psychology*, April 1934, by E. L. Thorndike and Ella Woodyard, entitled "The influence of the relative frequency of successes and frustrations upon intellectual achievement."

ing a *B* group of fifty or one hundred rich in successes with that done at an *A* group of five tasks following a *B* group of fifty or one hundred poor in successes, or almost entirely devoid of such. The subjects were college undergraduates and educated adults. The tasks were (I, rhymes) writing words to rhyme with given words; (II, completions) supplying letters to complete words; (III, anagrams) writing words made from given letters; (IV, opposites), writing the opposites of given words; and (V, equations) making true equations from given numbers and signs. The time per task was five seconds for I and II, seven and one-half seconds for III and IV, and ten seconds for V. Samples of the series with fewest chances for success, and of the instructions given to the subjects, are shown below. Lack of space prevents showing samples of the sets with a moderate number and with many chances for success.

SAMPLES OF *B* 11-100 FOR RHYMES I, COMPLETIONS I, AND ANAGRAMS I;
THAT IS, FOR THE SETS WITH FEWEST CHANCES FOR SUCCESSSES

17. almost	57. canopy	97. euphony
18. animate	58. capsule	98. exodus
19. anvil	59. caramel	99. extra
20. archive	60. carpet	100. fetid
21. Argus	61. cathedral	101. fiat
22. auburn	62. caustic	102. gelatin
23. balsam	63. cosine	103. general
24. barrel	64. cribbage	104. hackney
17. botr . . .	57. fand	97. . . uda .
18. b . a . g . do . . .	58. f . sc . .	98. . ole . u . e
19. c . s . o . a . y	59. fi . ri . o . e .	99. . h . mele . .
20. ca . a . al . e . e	60. ite . .	100. . l . e . a . e
21. d . d . m . u .	61. im . e . i . e . .	101. . o . r . e . i .
22. di . i . a . i .	62. la . y . g . a .	102. . ar . . na . .
23. en . eo . .	63. me . di . a . .	103. . etap . o .
24. epe	64. men . a . e .	104. . . onc . u .
17. afnrstx	57. elmxy	97. adeeilluvv
18. acehrtty	58. aceilmos	98. adecmnu
19. hopstu	59. aehprty	99. acinsuv
20. aaceilmn	60. aaciilrv	100. aignwwx
21. agiklnw	61. acekw	101. aaaghnty
22. hmstuy	62. ioorssuv	102. adiimo
23. ihlmtuu	63. cionrz	103. aceilnuvz
24. aelttux	64. aegilruvz	104. ennox

SAMPLES OF THE HARDEST *B* SET OF OPPOSITES

16. cameo	.....	46. plastic	.....
17. draconian	.....	47. charlatan	.....
18. cyclic	.....	48. vestibule	.....
19. granular	.....	49. viscid	.....
20. natant	.....	50. dichotomous	.....
21. embossed	.....	51. subjunctive	.....
22. colophon	.....	52. caparisoned	.....
23. interlaced	.....	53. tax	.....
24. investiture	.....	54. dowel	.....
25. medicinal	.....	55. rubbish	.....

SAMPLES OF A HARD *B* SET OF DISARRANGED EQUATIONS

161.	$\frac{1}{4}$	$.7\frac{1}{2}$	2	3	5	+	+	\times	=	.....
162.	2	2	3	4	5	6	10	+	+	\times \times =
163.	.2	.6	1.6	4	5	+	\times	\div	=	.....
164.	$\frac{1}{2}$	$\frac{1}{2}$	1	$\frac{7}{5}$	$\frac{10}{7}$	+	-	\times	=	.....
165.	1	1	3	4	5	6	+	-	\times \times	=
166.	2	4	4	4	4	4	+	-	\times \times	=
167.	1	1	2	2	14	18	+	-	\div \div	=
168.	.2	.2	.4	.8	4	9	+	-	\times \times	=
169.	3	3	4	5	6	6	+	-	\times \times	=
170.	$\frac{1}{7}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{7}{12}$	$\frac{2}{3}$	\times	\times	\div	=	.....

We have carried out seven experiments with college students and educated adults. The results from Experiment *G*, which we describe, are typical.

THE INFLUENCE UPON ACHIEVEMENT

In Experiment *G* thirty educated adults or adolescents over 18.0 years old worked with a long easy and long hard series. The tasks were dictated and the subject had to copy each (except for the opposites) before writing the solution. Consequently fewer tasks were used and more time per task (ten seconds for a completion, twelve seconds for a word with disarranged letters, and fifteen seconds for a disarranged equation). Also both series had six test completion tasks, five test disarranged-word tasks and five test equations inserted at the end of about eighteen, thirty-three, and fifty-two minutes in the course of the work period. The work-period was sixty-four minutes for the easy, and sixty-three and one-half minutes for the hard, series. Successes occurred in about one out of four tasks in the easy series, and in about one out of twenty in the hard series. The sixteen inserted tasks in the hard series showed 94 percent

as many successes as the sixteen of equal difficulty inserted in the easy series. The sixteen at the end of the hard series showed 95 percent as many successes as the sixteen of equal difficulty at the end of the easy series. These results cannot be taken quite at their face value because, in trials five days earlier with the easy series and four days earlier with the hard series, the easier series was run with times of seven and one-half, ten, and twelve seconds, whereas the hard was run as stated above. The memory advantage was thus somewhat greater for the hard series. But a generous allowance for this would still leave the percentages near ninety.

On the whole, it appears that the influence of infrequency of success in work periods up to fifty minutes is largely subject to voluntary control through the summoning of contrary forces, in the case of educated adults.

THE INFLUENCE UPON LEARNING

Experiment *G* also provides evidence concerning the impairment in learning, i.e., profit from the experience, due to a very high versus a moderate proportion of frustrations. We use as material, first the records with five, five and six tasks inserted at three points in a "hard" series containing on the average only one success in twenty and those of five, five and six tasks of equal difficulty inserted at three points in an "easy" series containing on the average one success in four. We observe, in the case of each task, whether it was done correctly in the first trial with the series. If it was not, no more attention is paid to it, but if it was, we observe whether it was also done correctly in a second trial which occurred four days later in the case of the "hard" series and five days later in the case of the "easy" series. The successes in the first trial of the "hard" series showed 84.4 percent of successes in the second. The successes in the first trial of the "easy" series showed 85.8 percent. The advantage for the easy series would probably have been a little greater if the time interval had been four days for it, and if certain minor disturbing factors which operated on the first trial of the easy series had been avoided. Possibly the 85.5 might have been as high as 90.

Next we make a similar comparison, but using the records for sixteen tasks located at the end of the "hard" series and sixteen at the end of the "easy" series. The percentages for the repetitions of success are 76.2 (hard) and 81.2 (easy). For the reasons just given the 81.2 is probably a bit too low, and might, with perfect equality of conditions other than the frequency of successes during the work period, have been as high as 85.

There is thus some impairment of the ability to learn when the mind is suffering, and has been suffering, very frequent frustrations. We can determine roughly how much by finding the corresponding percentages of repetition for tasks done correctly in thirty of varying difficulty given at the beginning of the "hard" and thirty of varying difficulty given at the beginning of the "easy" series. These were 89.5 and 80.7 respectively. In the hard series, then, the inserted and final tasks were learned about nine-tenths as often as the beginning tasks. In the easy series, the inserted and final tasks were learned about three percent oftener than the beginning tasks. Learning is reduced by about one-eighth by the greater frequency of frustrations.

APPENDIX III

A PROVISIONAL INVENTORY OF EXPERIENCES WHICH TEND TO SATISFY AND OF THOSE WHICH TEND TO ANNOY MAN, APART FROM ANY RESULTS OF TRAINING

SATISFIERS

- I. 1. sweet tastes, unless one is replete
- 2. fruity flavors, unless one is replete
- 3. nutty flavors, unless one is replete
- 4. meaty flavors, unless one is replete
- 5. salty tastes, after deprivation
- 6. chewing, after deprivation
- 7. a full stomach functioning normally
- 8. liquid in the mouth, in case of dryness of the membranes
- 9. swallowing liquid, in case of dehydration of the body
- II. 1. warming the surface of the body, after chilling below habitual temperature
- 2. cooling the surface of the body, after heating above habitual temperature
- 3. cooling the upper alimentary tract, after heating above habitual temperature
- III. 1. muscular activity, after deprivation; especially rhythmical activity and running, jumping, climbing, swinging, dodging, clinging, reaching, grasping, pulling, throwing
- 2. muscular inactivity, after abundant exercise
- IV. successful courtship and love between the sexes¹
- V. successful motherhood, cuddling and fondling a baby, nursing it, protecting it

¹ Including various activities and experiences in connection with display, attention-getting, pursuit, allurements, capture, submission, fondling, etc.

- VI.
 - 1. approaching what one pursues
 - 2. leaping upon what one pursues
 - 3. seizing what one pursues
 - 4. forcing what one pursues into quiescence
- VII.
 - 1. struggling with an animated opponent
 - 2. clutching it, throwing it down
 - 3. being on top of it
 - 4. shoving it aside
 - 5. escaping from its clutches
- VIII.
 - 1. the presence of human beings
 - 2. concerted action as one of a crowd
- IX.
 - 1. receiving favorable attention
 - 2. humble approval from any person; admiring glances and sounds
 - 3. smiles and fondling from those above one in mastery-status
 - 4. friendly behavior
- X.
 - 1. submissive behavior of others when one is set toward mastery
 - 2. submissive behavior by oneself when one is set toward submission
- XI.
 - 1. attaining before others do a goal which they seek
 - 2. pulling toward oneself an object which others are trying to pull toward themselves
 - 3. holding what others are trying to take away from one
 - 4. getting the attention of one whose attention others are trying to get
 - 5. other successes in instinctive rivalry
- XII.
 - 1. Seeing and hearing children laughing, gurgling, cooing, crowing, smiling, snuggling
 - 2. giving bits of food to a child or animal and seeing it eat
- XIII. a feeling of security and confidence, often aided by
 - 1. being in familiar surroundings after deprivation therefrom;
 - 2. the company of familiar persons;
 - 3. "being in a sheltered nook open on only one side"; especially having something solid behind one

- XIV. excitement and elation, often aided by change of scene, rapid motion, and exploration
- XV. unforced mental activity
- XVI. curious examination, manipulation and dismemberment of objects
- XVII. the normal flow of life. (This is satisfying rather than indifferent. Annoyances come as contrasts to, and pronounced satisfactions as accentuations of, a general status of content.)

ANNOYERS

- A.
 - 1. bitter tastes
 - 2. very sour tastes
 - 3. pangs from the contractions of an empty stomach
 - 4. faintness
 - 5. nausea
 - 6. dryness of the membranes of the mouth
 - 7. other features of thirst
- B.
 - 1. continued chilling of the body
 - 2. continued overheating of the body
- C.
 - 1. muscular activity when weary
 - 2. muscular inactivity when craving exercise
- D.
 - 1. thwarted courtship; unrequited love
 - 2. losing the baby one has mothered
- E.
 - 1. being interfered with in one's movements by being held, opposed, pushed, etc.
 - 2. being thwarted in any original tendency
 - 3. being confined in a small enclosure
- F. being seized, slapped, or bitten
- G. the presence of another male of the same species when one is courting a female
- H. solitude
- I.
 - 1. being neglected
 - 2. scorn; derision
- J.
 - 1. the perception of another getting attention which one craves for oneself

2. the perception of another getting affection which one craves for oneself
 3. the perception of another getting approval which one craves for oneself
- K. seeing and hearing children in distress
- L. 1. strangeness *per se*
2. too long absence from familiar surroundings
- M. darkness
- N. being unexpectedly brushed or clutched
- O. large objects advancing toward one violently
- P. snakes
- Q. contact with worms, spiders, and other crawling things
- R. howls, moans, groans, squeaks, grating noises, human cries of pain and rage

The items of this inventory illustrate the general principles that the normal operation of any tendency which man has by virtue of his heredity, that is, his genes, is satisfying, that for any such tendency to be thwarted or interfered with is annoying, and that for any such tendency to be deprived of opportunity to act is annoying. These principles, though sound, do not help much in obtaining agreement concerning the particulars of the inventory, for the diversity of opinion concerning the tendencies which man has apart from all training by virtue of the genes in his chromosomes is very great. For moderate views the reader may consult L. L. Bernard, *Instinct*, J. Drever, *Instinct in Man*, and E. L. Thorndike, *The Original Nature of Man*.

APPENDIX IV

THE REPORTED STRENGTH OF VARIOUS AVERSIONS

TABLE 9

Prices reported for enduring various sufferings and deprivations by unemployed young men and young women

Item	Estimates of Money Equivalent			
	20 Men: Age 20-29		20 Women: Age 20-29	
	Median	Range	Median	Range
4 (Lose left arm)	1000 million	1000 to ∞	1 million	10,000 to ∞
9 (Lose one leg)	1000 million	500 to ∞	12½ million	15,000 to ∞
3 + 7 + 8 + 11 (Lose one ear, hair, pock-marks)	125,000	4000 to ∞	2 million	300,000 to ∞
6 (Lose one toe)	50,000	500 to ∞	500,000	500 to ∞
14 + 16 + 17 (Unable to chew, taste, smell)	∞	125,000 to ∞	∞	35,000 to ∞
18 (Need ¼ more sleep)	500,000	20 to ∞	10,000	500 to ∞
19 + 20 (Trance 2 months of the year)	2 million	5000 to ∞	200,000	1500 to ∞
21 + 22 (Insane temporarily)	95 million	26,000 to ∞	4½ million	200,000 to ∞
Average of 24 + 25 + 26 + 27 (live in Iceland, Japan, Russia, Nicaragua)	2¼ million	0 to ∞	600,000	17,000 to ∞
Average of 28 + 29 (live in New York, Boston)	40,000	0 to ∞	30,000	0 to ∞
30 (live on Kansas farm)	1 million	0 to ∞	55,000	10,000 to ∞
31 (confined to apartment)	10 million	0 to ∞	62½ million	50,000 to ∞
32 + 33 + 34 + 35 (eat beetle and earthworm)	48,000	4 to ∞	950,000	2200 to ∞
36 (secret cannibalism)	50,000	40 to ∞	750,000	500 to ∞
37 (public cannibalism)	260 million	250 to ∞	1¾ million	5000 to ∞
38 (intoxicated)	25	0 to ∞	98	0 to ∞
39 + 42 (choke cat and cut pig's throat)	2500	2 to ∞	105,000	25 to ∞
40 (let snake coil around)	100	0 to ∞	400	10 to 7,000,000
41 (disturbance in church)	1250	20 to ∞	1000	15 to ∞
43 (act the fool on the street)	125	3 to 1,000,000	75	5 to 100,000
44 + 45 (spit on pictures of Darwin and Washington)	30	0 to ∞	20	0 to 475
46 (spit on picture of one's mother)	25,000	1 to ∞	500,000	5 to ∞
47 (spit on crucifix)	60	0 to ∞	5	0 to ∞
48 (hour of severest pain)	250	3 to ∞	325,000	10 to ∞
49 (restricted diet for one year)	50,000	100 to ∞	10,000	100 to 750,000
50 (no sugar, tea, coffee, tobacco, alcohol for one year)	5000	4 to ∞	1000	1 to 500,000
51 (lose all hope of life after death)	1000	0 to ∞	10	0 to ∞

APPENDIX V

THE INTEREST IN CURIOSITY AND ADVENTURE IN YOUNG ADULTS AND OLD ADULTS

A SUMMARY of the estimates reported is presented in Table 10. Although the cash estimates (Item 100) show greater aversion to confinement at hard labor on the part of the old, they offer to endure nearly as much of it to ride on an elephant, see Niagara Falls, etc., as the young do. Averaging the estimates for men and women of days spent at hard labor, we have:

	<i>Young</i>			<i>Old</i>		
	<i>Average</i>	<i>Median</i>	<i>Percent one or more days</i>	<i>Average</i>	<i>Median</i>	<i>Percent one or more days</i>
For \$500 cash .	37.2	11	95	23.3	10	77
For Items 3-99	8.5	0.5	20	14.3	10.5	16
For Items 8-86	202.5	98	82	234.2	40	62

By averages the old offer to endure more days in jail for Items 3-99; by medians, they offer to endure about the same; but the percentages of them bidding one day or more in the case of each item are somewhat lower. By averages they offer to endure more for Items 8-86; by medians they offer to endure less; and the percentage of them bidding one day or more is less.

TABLE 10

Comparison of young adults and old adults in respect of estimated bids of days in prison
endurable for the items specified

	YM = young males		OM = old males		YF = young females		OF = old females		PERCENT BIDDING ONE DAY OR MORE			
	AVERAGE NUMBER OF DAYS ESTIMATED		MEDIAN NUMBER OF DAYS ESTIMATED		YF		OF		YM	YF	OM	OF
	YM	YF	OM	OF	YM	YF	OM	OF	YM	YF	OM	OF
3. ride on elephant	0	0.3	0.1	0.3	0	0	0	0	0	23	5	23
18. see man hanged	0	0	0.2	0	0	0	0	0	0	0	5	0
30. chance to smoke opium	0	0.3	0	0	0	0	0	0	0	6	0	0
49. ride on a camel	0.2	0.3	0	0.1	0	0	0	0	5	17	0	8
15. hour's talk — Mussolini	0.5	1.8	1.0	8.2	0	1	0	0	15	39	20	31
16. hour's talk — Stalin	1.6	2.4	2.4	8.9	0	$\frac{1}{2}$	0	0	30	50	32	31
50. hour's talk — Roosevelt	4.2	1.0	3.6	0.6	$\frac{1}{4}$	$\frac{3}{8}$	1	0	50	44	58	31
94. hour's talk — Garbo	0.7	0.3	0.1	0	0	0	0	0	15	17	10	0
95. see a bull-fight	0.1	0.1	0.3	0.5	0	0	0	0	10	11	10	23
99. go up 15,000 ft. in a balloon	0.9	2.3	1.1	0.5	0	0	0	0	25	33	21	15
Total	8.2	8.8	9.4	19.1					150	240	167	102
8. see Niagara Falls	1.9	2.5	0.8	1.3	0	0	0	0	40	73	37	38
24. 2 weeks' trip to Caribbean	11.2	31.3	5.0	12.6	4 $\frac{1}{2}$	7 $\frac{1}{2}$	5	2	80	89	63	62
51. 2 months in Florida	7.8	9.0	9.7	58.3	7	5	2 $\frac{1}{2}$	5 $\frac{1}{2}$	95	89	68	62
52. 2 months in California	8.0	10.3	11.8	54.1	7	10	5	6 $\frac{1}{2}$	90	89	74	62
59. 1 week in Washington	1.2	2.1	1.1	3.8	$\frac{1}{4}$	2	1	0	55	83	58	38
75. 1 year's cruise around world	67.3	100.6	47.2	148.4	50	30	3	22 $\frac{1}{2}$	95	100	74	85
76. 1 year in Europe	71.6	72.1	34.5	69.7	45	25	12 $\frac{1}{2}$	14 $\frac{1}{2}$	100	100	79	85
86. San Francisco and return	3.3	4.8	1.3	8.7	$\frac{1}{2}$	2	0	0	50	78	74	38
Total	172.3	232.7	111.4	350.9					605	701	527	470
100. \$500 in cash	43.2	31.1	13.1	33.4	15	7	5 $\frac{1}{2}$	14 $\frac{1}{2}$	95	94	84	69

APPENDIX VI

TESTS AND RECORDS USEFUL IN ADULT EDUCATION

TESTS OF ABILITIES

WE present one form of the original Army Alpha as a sample test of so-called general intelligence.

Dr. Lorge has administered the I. E. R. Intelligence Scale CAVD, three forms of the Army Alpha Examination and the Otis Self Administering Test of Mental Ability to some 150 adults from a group of workers who have been supplied to the Institute of Educational Research by the C. W. S. governmental agency. As a result of this testing we can recommend to anyone in charge of adult classes who wishes to secure an intelligence measure of his group the use of the Otis Self Administering Test of Mental Ability, published by the World Book Company, Yonkers, N. Y. It can be administered in 35 to 40 minutes of time, the actual writing time being 30 minutes. It does not require giving of time signals except for beginning and stopping work. It can be scored and compared with norms by any careful clerk of high school graduate ability. Equally we can recommend the use of Army Alpha. Its actual writing time is about 23 minutes. Giving instructions, timing and the like are more complicated than for the Otis Test, a stop watch being required. It has the advantage of norms based on country-wide populations. Of the forms available, we recommend first, the Bregman Revision; second, Form 5; third, the Wells Revision. Any of these may be obtained from the Psychological Corporation, 522 Fifth Avenue, New York City.

If a highly scientific measurement of abstract intellectual ability is desired, the I. E. R. Intelligence Scale is to be recommended. It is not a time test, but requires usually three or four hours to write. It is easily administered and in some forms

can be scored by persons who are careful even though untrained, and its reliability is much higher than for the other tests. Because of its time requirement, however, it may be less practicable for adult class groups than the Otis Self Administering or the Bregman Army Alpha.

This examination is obtainable from the

BUREAU OF EDUCATIONAL MEASUREMENTS & STANDARDS

Kansas State Normal School

Emporia, Kansas

ARMY GROUP EXAMINATION ALPHA. FORM 5

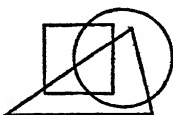
In Test 1 the person tested follows twelve directions, progressing from very easy to difficult.

TEST 1

1. ○ ○ ○ ○ ○

2. ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

3. 

4. 

5. ○ ○ ○ Yes No

6. ○ ○ ○ ○ ○

7. **A B C D E F G H I J K L M N O P**

8. ○ ○ ○ *MILITARY GUN CAMP*

9. 34-79-56-87-68-25-82-47-27-31-64-93-71-41-52-99

10.

--	--	--	--	--

11.

7F	4	3	5A	8	2	6	9B	3
----	---	---	----	---	---	---	----	---

12. 1 2 3 4 5 6 7 8 9

Score.

1	
2	
3	
4	
5	
6	
7	
8	
T	

TEST 2

Get the answers to these examples as quickly as you can.

Use the side of this page to figure on if you need to.

-
- SAMPLES { 1 How many are 5 men and 10 men? . Answer (15)
- 2 If you walk 4 miles an hour for 3 hours, how far do you walk? Answer (12)
- 1 How many are 30 men and 7 men? Answer ()
- 2 If you save \$7 a month for 4 months, how much will you save? Answer ()
- 3 If 24 men are divided into squads of 8, how many squads will there be? Answer ()
- 4 Mike had 12 cigars. He bought 3 more, and then smoked 6. How many cigars did he have left? Answer ()
- 5 A company advanced 5 miles and retreated 3 miles. How far was it then from its first position? Answer ()
- 6 How many hours will it take a truck to go 66 miles at the rate of 6 miles an hour? Answer ()
- 7 How many cigars can you buy for 50 cents at the rate of 2 for 5 cents? Answer ()
- 8 A regiment marched 40 miles in five days. The first day they marched 9 miles, the second day 6 miles, the third 10 miles, the fourth 8 miles. How many miles did they march the last day? Answer ()
- 9 If you buy two packages of tobacco at 7 cents each and a pipe for 65 cents, how much change should you get from a two-dollar bill? Answer ()
- 10 If it takes 6 men 3 days to dig a 180-foot drain, how many men are needed to dig it in half a day? Answer ()
- 11 A dealer bought some mules for \$800. He sold them for \$1,000, making \$40 on each mule. How many mules were there? Answer ()
- 12 A rectangular bin holds 400 cubic feet of lime. If the bin is 10 feet long and 5 feet wide, how deep is it? Answer ()
- 13 A recruit spent one-eighth of his spare change for post cards and four times as much for a box of letter paper, and then had 90 cents left. How much money did he have at first? Answer ()
- 14 If $3\frac{1}{2}$ tons of coal cost \$21, what will $5\frac{1}{2}$ tons cost? Answer ()
- 15 A ship has provisions to last her crew of 500 men 6 months. How long would it last 1,200 men? Answer ()
- 16 If a man runs a hundred yards in 10 seconds, how many feet does he run in a fifth of a second? Answer ()
- 17 A U-boat makes 8 miles an hour under water and 15 miles on the surface. How long will it take to cross a 100-mile channel, if it has to go two-fifths of the way under water? Answer ()

- 18 If 241 squads of men are to dig 4,097 yards of trench, how many yards must be dug by each squad? . . . Answer ()
- 19 A certain division contains 3,000 artillery, 15,000 infantry and 1,000 cavalry. If each branch is expanded proportionately until there are in all 20,900 men, how many will be added to the artillery? Answer ()
- 20 A commission house which had already supplied 1,897 barrels of apples to a cantonment delivered the remainder of its stock to 29 mess halls. Of this remainder each mess hall received 54 barrels. What was the total number of barrels supplied? Answer ()

TEST 3

This is a test of common sense. Below are sixteen questions. Three answers are given to each question. You are to look at the answers carefully; then make a cross in the square before the best answer to each question, as in the sample:

SAMPLE	{	Why do we use stoves? Because
		<input type="checkbox"/> they look well
		<input checked="" type="checkbox"/> they keep us warm
		<input type="checkbox"/> they are black

Here the second answer is the best one and is marked with a cross. Begin with No. 1 and keep on until time is called.

- Cats are useful animals, because
 - ☐ they catch mice
 - ☐ they are gentle
 - ☐ they are afraid of dogs
- Why are pencils more commonly carried than fountain pens? Because
 - ☐ they are brightly colored
 - ☐ they are cheaper
 - ☐ they are not so heavy
- Why is leather used for shoes? Because
 - ☐ it is produced in all countries
 - ☐ it wears well
 - ☐ it is an animal product
- Why judge a man by what he does rather than by what he says? Because?
 - ☐ what a man does shows what he really is
 - ☐ it is wrong to tell a lie
 - ☐ a deaf man cannot hear what is said
- If you were asked what you thought of a person whom you didn't know, what should you say?
 - ☐ I will go and get acquainted
 - ☐ I think he is all right
 - ☐ I don't know him and can't say

- 6 Streets are sprinkled in summer
 - ☐ to make the air cooler
 - ☐ to keep automobiles from skidding
 - ☐ to keep down dust
- 7 Why is wheat better for food than corn? Because
 - ☐ it is more nutritious
 - ☐ it is more expensive
 - ☐ it can be ground finer
- 8 If a man made a million dollars, he ought to
 - ☐ pay off the national debt
 - ☐ contribute to various worthy charities
 - ☐ give it all to some poor man
- 9 Why do many persons prefer automobiles to street cars? Because
 - ☐ an auto is made of higher grade materials
 - ☐ an automobile is more convenient
 - ☐ street cars are not as safe
- 10 The feathers on a bird's wing help him to fly because they
 - ☐ make a wide, light surface
 - ☐ keep the air off his body
 - ☐ keep the wings from cooling off too fast
- 11 All traffic going one way keeps to the same side of the street because
 - ☐ most people are right handed
 - ☐ the traffic policeman insists on it
 - ☐ it avoids confusion and collisions
- 12 Why do inventors patent their inventions? Because
 - ☐ it gives them control of their inventions
 - ☐ it creates a greater demand
 - ☐ it is the custom to get patents
- 13 Freezing water bursts pipes because
 - ☐ cold makes the pipes weaker
 - ☐ water expands when it freezes
 - ☐ the ice stops the flow of water
- 14 Why are high mountains covered with snow? Because
 - ☐ they are near the clouds
 - ☐ the sun seldom shines on them
 - ☐ the air is cold there
- 15 If the earth were nearer the sun
 - ☐ the stars would disappear
 - ☐ our months would be longer
 - ☐ the earth would be warmer
- 16 Why is it colder nearer the poles than near the equator? Because
 - ☐ the poles are always farther from the sun
 - ☐ the sunshine falls obliquely at the poles
 - ☐ there is more ice at the poles

TEST 4

If the two words of a pair mean the same or nearly the same, draw a line under same. If they mean the opposite or nearly the opposite, draw a line under opposite. If you cannot be sure, guess. The two samples are already marked as they should be.

SAMPLES		good—bad same—opposite	
		little—small same—opposite	
1	wet—dry	same—opposite	1
2	in—out	same—opposite	2
3	hill—valley	same—opposite	3
4	allow—permit	same—opposite	4
5	expand—contract	same—opposite	5
6	class—group	same—opposite	6
7	former—latter	same—opposite	7
8	confess—admit	same—opposite	8
9	shy—timid	same—opposite	9
10	delicate—tender	same—opposite	10
11	extinguish—quench	same—opposite	11
12	cheerful—melancholy	same—opposite	12
13	accept—reject	same—opposite	13
14	concave—convex	same—opposite	14
15	lax—strict	same—opposite	15
16	assert—maintain	same—opposite	16
17	champion—advocate	same—opposite	17
18	adapt—conform	same—opposite	18
19	debase—exalt	same—opposite	19
20	dissension—harmony	same—opposite	20
21	repress—restrain	same—opposite	21
22	bestow—confer	same—opposite	22
23	amenable—tractable	same—opposite	23
24	avert—prevent	same—opposite	24
25	reverence—veneration	same—opposite	25
26	fallacy—verity	same—opposite	26
27	specific—general	same—opposite	27
28	pompous—ostentatious	same—opposite	28
29	accumulate—dissipate	same—opposite	29
30	apathy—indifference	same—opposite	30
31	effeminate—virile	same—opposite	31
32	peculation—embezzlement	same—opposite	32
33	benign—genial	same—opposite	33
34	acme—climax	same—opposite	34
35	largess—donation	same—opposite	35
36	innuendo—insinuation	same—opposite	36
37	vesper—matin	same—opposite	37
38	aphorism—maxim	same—opposite	38
39	abjure—renounce	same—opposite	39
40	encomium—eulogy	same—opposite	40

TEST 5

The words A EATS COW GRASS in that order are mixed up and don't make a sentence; but they would make a sentence if put in the right order: A COW EATS GRASS, and this statement is true.

Again, the words HORSES FEATHERS HAVE ALL would make a sentence if put in the order ALL HORSES HAVE FEATHERS, but this statement is false.

Below are twenty-four mixed-up sentences. Some of them are true and some are false. When I say "go," take these sentences one at a time. Think what each would say if the words were straightened out, but don't write them yourself. Then, if what it would say is true, draw a line under the word "true"; if what it would say is false, draw a line under the word "false." If you can not be sure, guess. The two samples are already marked as they should be. Begin with No. 1 and work right down the page until time is called.

SAMPLES	{ a eats cow grass		true..false
	{ horses feathers have all		true..false
1	lions strong are	true..false	1
2	houses people in live	true..false	2
3	days there in are week eight a	true..false	3
4	leg flies one have only	true..false	4
5	months coldest are summer the	true..false	5
6	gotten sea water sugar is from	true..false	6
7	honey bees flowers gather the from	true..false	7
8	and eat good gold silver to are	true..false	8
9	president Columbus first the was America of	true..false	9
10	making is bread valuable wheat for	true..false	10
11	water and made are butter from cheese	true..false	11
12	sides every has four triangle	true..false	12
13	every times makes mistakes person at	true..false	13
14	many toes fingers as men as have	true..false	14
15	not eat gunpowder to good is	true..false	15
16	ninety canal ago built Panama years was the	true..false	16
17	live dangerous is near a volcano to it	true..false	17
18	clothing worthless are for and wool cotton	true..false	18
19	as sheets are napkins used never	true..false	19
20	people trusted intemperate be always can	true..false	20
21	employ debaters irony never	true..false	21
22	certain some death of mean kinds sickness	true..false	22
23	envy bad malice traits are and	true..false	23
24	repeated call human for courtesies associations	true..false	24

TEST 6

SAMPLES	{	2	4	6	8	10	12	---14---	---16---
		9	8	7	6	5	4	--- 3---	--- 2---
		2	2	3	3	4	4	--- 5---	--- 5---
		1	7	2	7	3	7	--- 4---	--- 7---

Look at each row of numbers below, and on the two dotted lines write the two numbers that should come next.

3	4	5	6	7	8	-----	-----
10	15	20	25	30	35	-----	-----
8	7	6	5	4	3	-----	-----
3	6	9	12	15	18	-----	-----
5	9	13	17	21	25	-----	-----
8	1	6	1	4	1	-----	-----
27	27	23	23	19	19	-----	-----
1	2	4	8	16	32	-----	-----
8	9	12	13	16	17	-----	-----
9	9	7	7	5	5	-----	-----
19	16	14	11	9	6	-----	-----
2	3	5	8	12	17	-----	-----
11	13	12	14	13	15	-----	-----
29	28	26	23	19	14	-----	-----
18	14	17	13	16	12	-----	-----
81	27	9	3	1	$\frac{1}{3}$	-----	-----
20	17	15	14	11	9	-----	-----
16	17	15	18	14	19	-----	-----
1	4	9	16	25	36	-----	-----
3	6	8	16	18	36	-----	-----

SAMPLES { sky—blue :: grass—table
fish—swims :: man—paper
day—night :: white—red }

green warm big
time walks girl
black clear pure

In each of the lines below, the first two words are related to each other in some way. What you are to do in each line is to see what the relation is between the first two words, and underline the word in heavy type that is related in the same way to the third word. Begin with No. 1 and mark as many sets as you can before time is called.

1	gun—shoots :: knife—run	cuts	hat	bird	1
2	ear—hear :: eye—table	hand	see	play	2
3	dress—woman :: feathers—bird	neck	feet	bill	3
4	handle—hammer :: knob—key	room	shut	door	4
5	shoe—foot :: hat—coat	nose	head	collar	5
6	water—drink :: bread—cake	coffee	eat	pie	6
7	food—man :: gasoline—gas	oil	automobile	spark	7
8	eat—fat :: starve—thin	food	bread	thirsty	8
9	man—home : bird—fly	insect	worm	nest	9
10	go—come :: sell—leave	buy	money	papers	10
11	peninsula—land :: bay—boats	pay	ocean	Massachusetts	11
12	hour—minute :: minute—man	week	second	short	12
13	abide—depart :: stay—over	home	play	leave	13
14	January—February :: June—July	May	month	year	14
15	bold—timid :: advance—proceed	retreat	campaign	soldier	15
16	above—below :: top—spin	bottom	surface	side	16
17	lion—animal :: rose—smell	leaf	plant	thorn	17
18	tiger—carnivorous :: horse—cow	pony	buggy	herbivorous	18
19	sailor—navy :: soldier—gun	cap	hill	army	19
20	picture—see :: sound—noise	music	hear	bark	20

TEST 8

Notice the sample sentence:

People hear with the eyes ears nose mouth

The correct word is **ears**, because it makes the truest sentence.

In each of the sentences below you have four choices for the last word. Only one of them is correct. In each sentence draw a line under the one of these four words which makes the truest sentence. If you cannot be sure, guess. The two samples are already marked as they should be.

SAMPLES		{ People hear with the eyes ears nose mouth				
		{ France is in Europe Asia Africa Australia				
1	America was discovered by Drake	Hudson	Columbus	Balboa	.	1
2	Pinochle is played with rackets	cards	pins	dice.	.	2
3	The most prominent industry of Detroit is	automobiles	brewing	flour packing.	.	3
4	The Wyandotte is a kind of horse	fowl	cattle	granite	.	4
5	The U. S. School for Army Officers is at	Annapolis	West Point	New Haven	.	5
6	Food products are made by	Smith & Wesson	Swift & Co.	W. L. Douglas	B. T. Babbitt	6
7	Bud Fisher is famous as an	actor	baseball player	comic artist	.	7
8	The Guernsey is a kind of	horse	goat	sheep	cow	8
9	Marguerite Clark is known as a	suffragist	singer	movie actress	writer	9
10	"Hasn't scratched yet" is used in advertising a	duster	flour	brush	cleanser	10
11	Salsify is a kind of	snake	fish	lizard	vegetable	11
12	Coral is obtained from	mines	elephants	oysters	reefs	12
13	Rosa Bonheur is famous as a	poet	painter	composer	sculptor	13
14	The tuna is a kind of	fish	bird	reptile	insect	14
15	Emeralds are usually	red	blue	green	yellow.	15

As an addition to or substitute for the general intelligence score, one may use school success with allowance for economic and social advantages or handicaps. A convenient measure is the grade reached at age 14, or 15, or 16, etc., modified by a factor expressing the amount of time and energy given to school work. The grade reached before leaving school and the age at which it was reached can be obtained and recorded in a few seconds, and should be secured for every student for whom any record whatsoever is kept.

We present a table (Table 11) by which the grade reached by any pupil leaving school at any age from 12 to 19 can be transmuted into a score indicative of his "general intelligence," assuming that he has had ordinary opportunities from age 6 to 19.¹

¹ Table 11 fits the promotion standards of New York City at 1920-1930. They used to be less generous. They may become more generous, especially in high schools, if the doctrine now advocated of fitting grades 9 to 12 to the great majority of persons, rather than to the top half or third, is put into practice.

TESTS OF ACHIEVEMENT

We present the economics test of the Cooperative Test Bureau as a sample of an instrument to measure the achievements or status of students.

COOPERATIVE ECONOMICS TEST¹

PROVISIONAL FORM 1933

by

J. E. Partington, State University of Iowa and Others

General Directions: Do not turn this page until the examiner tells you to do so. This examination consists of three parts and requires 90 minutes of working time. The directions for each part are printed at the beginning of the part. Read them carefully and proceed at once to answer the questions. Do NOT SPEND TOO MUCH TIME ON ANY ONE ITEM; ANSWER THE EASIER QUESTIONS FIRST, then return to the harder ones if you have time. There is a time limit for each part. You are not expected to answer all the questions in any part in the time limit, but if you should, go on to the next part. If you have not finished Part I when the time is up, stop work on that part and proceed at once to Part II. No questions may be asked after the examination has begun.

By exercising careful judgment and making shrewd guesses you may profitably answer questions about which you are not absolutely sure; but since your score will be the number of correct answers diminished by a number proportional to the number of wrong answers, you should avoid answering questions about which you are totally ignorant. Shrewd guessing based on intelligent inference will improve your score, but wild guessing on questions that are entirely unknown to you will waste time which you could better put on other questions in the test, and may result in a large subtraction from the number of your correct answers.

Part	Minutes	Score			Percentile		
I	30						
II	25						
III	35						
Total	90						

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PART I

Directions: In each of the following exercises you will find three statements in the right-hand column, each of which defines or suggests one of the five terms in the left-hand column. In the parentheses following each statement write the number of the term to which it *best* applies.

-
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|-----------|--|
| 1. Wealth | 1. Includes all articles possessing utility () |
| 2. Goods | 2. Funds committed to an economic enterprise for the purpose of securing a financial return. () |
| 3. Income | 3. The power of a commodity to command other articles in exchange for itself . () |
-

- | | |
|----------------------------|--|
| 1. Diminishing value | 4. Implies that continued efforts to increase proportionally the yield from a given piece of land, by using additional amounts of labor and capital, will eventually be unsuccessful () |
| 2. Diminishing utility | 5. Implies that cost of production is not decreasing as fast as gross income . () |
| 3. Diminishing returns | 6. Implies that the desire of an individual for any particular good may be satiated () |
| 4. Decreasing productivity | |
| 5. Diminishing profits | |
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|----------------------|---|
| 1. Chain stores | 7. All economic agents between the manufacturers and the consumers of an article. () |
| 2. Department stores | 8. Retail establishments which always sell a wide variety of merchandise under one roof to a local market () |
| 3. Mail order houses | 9. Large retail organizations which rely mainly upon catalogue advertising to sell their goods () |
| 4. Mercantilists | |
| 5. Middlemen | |
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|-----------------|--|
| 1. Conservation | 10. Constitutes the most important factor in assuring a continued yield from agricultural land () |
| 2. Cooperation | 11. Refers to an economic activity which is closely concerned with the exchange of commodities () |
| 3. Fertility | 12. The capacity of a good to satisfy human wants () |
| 4. Location | |
| 5. Utility | |
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|--------------------|--|
| 1. Highways | 13. Primarily concerned with the production of time utility () |
| 2. Bankers | 14. Primarily concerned with the production of place utility () |
| 3. Tailors | 15. Primarily concerned with the production of form utility () |
| 4. Grain elevators | |
| 5. Lawyers | |

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|-------------------------------|--|
| 1. Dividends | 16. A kind of financial obligation to which the stockholders of a state bank are usually subject () |
| 2. Double liability | 17. Payment made by a corporation to its bondholders () |
| 3. Interest | 18. A form of financial risk which is ordinarily assumed by the common stockholders in a corporation () |
| 4. Limited liability | |
| 5. Unlimited liability | |
| <hr/> | |
| 1. Aggregate utility | 19. The power of a commodity to satisfy human wants because of a change in its form () |
| 2. Composition utility | 20. The measure of the amount of want-satisfaction that would be lost were the entire supply of a given commodity lost () |
| 3. Diminishing utility | 21. The ability of any unit of a given supply possessed by an individual to satisfy his desire for that commodity () |
| 4. Marginal utility | |
| 5. Service utility | |
| <hr/> | |
| 1. Agriculture | 22. Usually regarded as the basic industry in the United States today () |
| 2. Lumbering | 23. An industry made up very largely of middlemen. () |
| 3. Manufacturing | 24. An extractive industry whose center of operations in the United States has moved to the North Pacific states in recent decades. () |
| 4. Merchandising | |
| 5. Mining | |
| <hr/> | |
| 1. Legal tender | 25. Really a warehouse receipt for gold deposited in the United States Treasury . () |
| 2. Gold certificate | 26. The amount of credit on the books of a Federal Reserve bank which a member bank must have against its own deposits () |
| 3. Greenback | 27. A form of paper money which is legal tender for all debts, public and private, except duties on imports and interest on the public debt () |
| 4. Legal reserve | |
| 5. Lawful money | |
| <hr/> | |
| 1. Consumers' cooperation | 28. A form of cooperation which is distinctly more successful in Europe than in the United States, primarily because the people of Europe are more thrifty and class conscious () |
| 2. Cooperative credit | 29. A form of cooperation which is often regarded as a remedy for many of the farmer's economic ills () |
| 3. Economic cooperation | 30. A form of cooperation designed primarily to aid those of small means, who by becoming members are enabled to secure more favorable terms on the money they borrow () |
| 4. Cooperative marketing | |
| 5. Manufacturers' cooperation | |

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|---------------|--|
| 1. Boom | 31. Refers to a deposit or payment made to a broker for the protection of the broker () |
| 2. Commission | 32. Refers to a rather sudden increase in demand for commodities, accompanied by a marked rise in prices () |
| 3. Crisis | 33. Refers to a turning point in business conditions, usually accompanied by a sharp shrinkage of credit () |
| 4. Margin | |
| 5. Slump | |

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|-------------------------|---|
| 1. Credit money | 34. Illustrated by a twenty-dollar gold certificate () |
| 2. Fiat money | 35. Illustrated by a United States gold coin { |
| 3. Token money | 36. Illustrated by a Federal Reserve note . () |
| 4. Representative money | |
| 5. Standard money | |

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|-------------------|---|
| 1. Piece work | 37. Refers to a plan of payment not commonly used, but which gives the laborer a wage based upon the price received for the product () |
| 2. Profit sharing | 38. Refers to a plan of payment which frequently takes the form of free medical service, recreational facilities, etc. () |
| 3. Sliding scale | 39. Refers to a method by means of which wages can be most closely adjusted to the volume of output of the individual laborer () |
| 4. Time wage | |
| 5. Welfare work | |

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|--------------------|--|
| 1. Bankers' bank | 40. A bank which is practically prohibited from issuing notes to circulate as paper money because it has to pay so high a tax as to make such issuance unprofitable. () |
| 2. Commercial bank | 41. A bank which owns stock in one of the Federal Reserve banks () |
| 3. Member bank | 42. A type of bank which deals primarily with business men engaged in mercantile operations () |
| 4. State bank | |
| 5. Trust company | |

- | | |
|----------------------|---|
| 1. Clearing | 43. That function of a bank which has to do with what is ordinarily its chief source of income () |
| 2. Deposit | 44. That function of a bank which is illustrated when it acts as the transfer agent of the stock of a corporation () |
| 3. Loan and discount | 45. That function of a bank which usually involves a daily meeting of representatives of all the banks in a particular city () |
| 4. Note issue | |
| 5. Trust | |

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|--------------------------|---|
| 1. Industrial democracy | 46. A modification of the wage system which involves employee representation in the management of the business () |
| 2. Piece work | 47. A modification of the wage system which is intended to result in rewarding each worker according to his own individual productivity () |
| 3. Profit sharing | 48. A modification of the wage system which is intended to result in rewarding the workmen as a group for efficient service () |
| 4. Scientific management | |
| 5. Welfare work | |
| <hr/> | |
| 1. Customs duty | 49. An important source of federal revenues, the burden of which cannot be shifted () |
| 2. Excise tax | 50. A flat rate tax, the burden of which cannot be shifted () |
| 3. General property tax | 51. An internal duty, which can often be passed on to the consumer of the article taxed () |
| 4. Net income tax | |
| 5. Poll tax | |
| <hr/> | |
| 1. Merger | 52. The basic form of artificial body authorized by law to act as a single person () |
| 2. Holding company | 53. A device, in the form of a corporation, whose assets usually consist chiefly of the stocks and bonds of other corporations () |
| 3. Corporation | 54. A device which is illegal in most states when used as a method of securing control of several competing business units () |
| 4. Monopoly | |
| 5. Trust | |
| <hr/> | |
| 1. Dividend | 55. Provides the basic data upon which premiums for life insurance policies are computed () |
| 2. Mortality table | 56. Refers to the sum of money which is refunded annually to the holder of a participating policy () |
| 3. Annuity | 57. Refers to the fund which life insurance companies are required by law to accumulate and out of which maturity and death benefits are paid in part () |
| 4. Reserve | |
| 5. Surplus | |
| <hr/> | |
| 1. Semi-skilled labor | 58. That form of labor which is best organized and most highly unionized () |
| 2. Skilled labor | 59. That type of labor upon which seasonal industries largely depend for their supply of employees () |
| 3. Immobile labor | 60. That type of labor which tends to be underpaid because it does not move about from place to place seeking the best market for its services () |
| 4. Immigrant labor | |
| 5. Migratory labor | |

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|----------------------|---|
| 1. Undivided profits | 61. This arises out of the permanent retention in the business of the profits accumulated by the corporation over a period of years () |
| 2. Pure profits | |
| 3. Net profits | |
| 4. Replacement fund | 62. That portion of the entrepreneur's total income which is in excess of the amount he would receive were he to work for some one else and rent his capital and land to others () |
| 5. Surplus | 63. That portion of the gross income in any given year which remains for the entrepreneur after his enterprise has paid its expenses () |

Number wrong 4) _____ Number right _____

Subtract _____

Score = Difference _____

PART II

Directions: Read these statements and mark each one in the parentheses at the right with a plus sign (+) if you think it is true, or with a zero (0) if you think it is false, wholly or in part.

1. The fact that human effort is required for its manufacture makes an article an economic good ()
2. Human beings, unless they are slaves, are not considered as wealth ()
3. In the United States, business men enjoy unrestricted freedom of enterprise ()
4. Regardless of the methods which characterize it, the function of an economic organization is to provide an agency for want-gratification ()
5. The black death tended to hasten the break-up of the medieval manor and was therefore an event of great economic significance ()
6. Methods of controlling industry may become obsolete just as machines and methods of manufacturing become obsolete ()
7. Slavery in its economic aspects was of little importance in the early agricultural development of the South ()
8. A nation may possess vast stores of natural resources and yet not be a wealthy nation ()
9. Under our present economic organization it is impossible for the volume of consumption to exceed the volume of production at any given time ()
10. The variety of wants that a people can satisfy corresponds to the variety of the natural resources which their country possesses ()
11. Production under our present-day methods tends to be a round-about process ()
12. The momentum of an early start may be the sole reason why one section of the country surpasses another section in a given line of industry ()
13. Destruction of wealth, as by a storm or fire, although it is economically wasteful, often increases the immediate demand for labor ()
14. The bearing of non-insurable risks is one of the functions of the business enterpriser ()
15. As a result of the law of diminishing returns, increasing the size of a business enterprise increases its per unit cost of production ()
16. The entrepreneur's wages of management are not included in the long run cost of production ()
17. Increased specialization ordinarily results in a greater degree of interdependence among the specialized producers ()
18. Anything that interferes with the free course of trade promotes specialization ()
19. The United States Post Office is one example of a publicly owned and operated business which is self-supporting ()
20. The powers of a corporation are limited to those granted and implied in its charter ()
21. A \$100 bond, paying \$6 a year interest and selling in the bond market for \$105, is said to offer a 6% yield ()

22. The expected rate of return on common stock is usually higher than that on bonds ()
23. A corporation whose earnings are relatively steady from year to year may safely issue more bonds and less common stock than one whose earnings fluctuate widely ()
24. A country whose chief industry is gold mining will tend to be relatively prosperous in a period of depression ()
25. Wholesale prices respond more quickly to changes in demand and supply than do retail prices ()
26. The demand for a commodity may be said to be elastic when a change in its price greatly changes the quantity sold ()
27. The development of the automobile has helped to reduce the price of kerosene ()
28. There is no way of representing in a graph the changes in the supply of a commodity accompanying changes in its price or cost of production ()
29. Normal price tends to equal cost of production, whereas market price tends to equalize supply and demand ()
30. Anyone who has cash or credit can personally buy and sell securities on the floor of the stock exchange ()
31. The first monetary system of the United States placed the country on a bimetallic standard ()
32. The Sherman Silver Purchase Act of 1890 provided for the free and unlimited coinage of silver ()
33. Under a bimetallic system, when the mint ratio of silver to gold is 16 to 1 and the market ratio is 18 to 1, silver tends to drive gold out of circulation ()
34. When the purchasing power of the dollar is decreasing, business is apt to be relatively active ()
35. Deposits in a commercial bank consist principally of time deposits ()
36. The drawing of a check for \$100 by A, which check is redeposited by B, both men having their accounts in the same bank, will result in a decrease of the bank's deposits by \$100 ()
37. An increase in bank loans generally is accompanied by an increase in bank deposits ()
38. A member bank of the Federal Reserve System cannot hold any of its legal reserves in its own vault ()
39. The Federal Reserve Act permits all member banks to issue national bank notes ()
40. Travel by Americans in England tends to increase the rate of exchange on London in New York ()
41. If prices here are low relative to the rest of the world, this condition tends to stimulate imports and to discourage exports from this country ()
42. In distribution, each factor of production receives its share of the returns at approximately the same time ()
43. Higher wages do not necessarily mean higher unit costs of production ()
44. No form of monopoly can be justified under our present economic organization ()
45. The economic rent on urban land is determined largely by its location ()

46. The rate of interest tends toward that point which will clear the market of loanable funds. ()
47. Almost all the net profits of American corporations are distributed to the bondholders as dividends ()
48. The general property tax tends to cause a competitive undervaluation of real property ()
49. An increase in a given tax rate need not result in an increase in the revenue derived from the tax ()
50. One of the chief reasons why railroads have practiced rate discriminations is that the law has attempted to maintain competitive practices in a naturally monopolistic industry which is over-expanded ()
51. The primary motive for the great westward movement in the United States was the development of manufacturing industries. ()
51. The net effect of the protective tariff is to decrease aggregate real wages in the United States ()
53. The problem of conservation with reference to forests is usually considered as a problem of the various state governments ()
54. The militant or syndicalistic group of socialists strives to realize its aims chiefly through influencing legislation ()
55. Organized labor in the United States is inclined to encourage strongly the development of profit-sharing systems ()
56. The greater the stability of the government, the greater will be the tendency of its people to save ()
57. Insurance often provides a basis for the extension of credit which would not otherwise be available ()
58. The undervaluation of real estate forces an increase in the millage rate ()

Number right

Number wrong

Score = Difference

PART III

Directions: This part of the test consists of a number of incomplete statements, each of which can be correctly completed by one of the four words or phrases following it. Examine each statement and select the word or phrase which *best* completes the statement; then write the number of this word or phrase in the parentheses after the statement.

1. All those goods which are used to produce more economic goods are called (1) capital, (2) consumers' goods, (3) producers' goods, (4) services ()
2. The exclusive right of an individual to control wealth is called (1) competition, (2) private property, (3) contract, (4) enterprise ()
3. One would classify as a laborer in the economic sense a (1) reporter on a city paper, (2) reporter on a college paper, (3) convict breaking stone, (4) mule pulling a load of cotton ()
4. Of the following articles, the one which best illustrates a producers' good is (1) a mountain lake, (2) the clothes worn by a laboring man, (3) a railroad, (4) a dining-room table ()
5. The essential characteristic of the household economy was (1) production for sale, but not for foreign markets, (2) its isolation, which resulted in economic self-sufficiency, (3) the important role played by money, (4) a rather definitely defined wage system among the producers ()
6. One of the important outcomes of the Industrial Revolution was an increase in the relative importance of the (1) capitalist, (2) agriculturalist, (3) retail merchant, (4) landlord ()
7. "Capitalistic economy," which is one of the possible forms of an industrial system, belongs in a classification based on (1) exchange, (2) production for use rather than for profit, (3) labor, (4) the functions performed in society by money and credit ()
8. The utility created by the dentist is known as (1) time, (2) place, (3) form, (4) elementary ()
9. The American Revolution was the outcome of the British economic policy of (1) laissez faire, (2) mercantilism, (3) protective tariff, (4) oppression ()
10. Of the following consumers, the one who would probably enjoy the greatest freedom of choice in determining the goods he would use is a (1) single man who is supporting his mother and receiving a salary of \$2400 per year, (2) married man who has no children and who receives a salary of \$2300 per year, (3) single man on a salary of \$2000 per year, (4) married man with a family of four receiving a salary of \$3000 per year ()
11. The essential difference between direct and indirect methods of production is that (1) indirect production is not dependent on the use of land, (2) direct production requires a longer working day, (3) indirect production involves the use of a larger quantity of capital, (4) direct production results in less wasted effort, in that it brings a larger product per unit of labor ()
12. John Smith's truck, when considered as a capital good, represents (1) individual and free capital, (2) social and specialized capital, (3) social and free capital, (4) individual and specialized capital ()

13. In a laissez faire system, (1) there are no laws regulating business enterprise, (2) competition is discouraged, (3) competition is relied upon as an important means of stimulating and guiding economic activity, (4) the government owns and operates most of the industries ()
14. The effects of the operation of the law of diminishing returns will become more quickly apparent to an individual farmer if (1) he practices wasteful farming methods, (2) he uses less capital and labor, (3) the market prices for agricultural products improve, (4) he raises more of his own food ()
15. The principle of division of labor finds least application, among the following, in the production of (1) automobiles, (2) tailor-made clothes, (3) story books, (4) chairs ()
16. Specialization has tended to encourage the use of woman labor because (1) it has stimulated the introduction of machines, many of which may be tended easily by women, (2) it has created a demand for labor which cannot be met entirely by men, (3) the output of woman labor is greater, (4) the hours of work are shorter today than formerly ()
17. One possible advantage of small-scale production over large-scale production is that (1) expensive experimentation and research can be carried on more advantageously, (2) better use can be made of newly invented specialized machinery, (3) adjustments to changing conditions can be made more quickly, (4) non-union men cannot be hired ()
18. A store which is owned by the consumers of the commodities sold is called (1) a chain store, (2) a cooperative store, (3) an independent grocery, (4) a department store ()
19. That type of business enterprise which inherently possesses the greatest possibility of a long life is the (1) individual enterprise, (2) partnership, (3) corporation, (4) limited partnership ()
20. The directors of a corporation will declare dividends payable at regular intervals if (1) the corporation is making money, (2) there are available surplus funds, (3) they are so ordered by the stockholders, (4) they consider it to be for the best interests of the corporation ()
21. A rise in the general price level tends to (1) increase the rate of return on outstanding bonds and common stocks, (2) increase the rate of return on outstanding bonds, without changing that on common stocks, (3) decrease the rate of return on outstanding bonds and common stocks, (4) increase the rate of return on common stocks, without changing that on outstanding bonds ()
22. A building and loan association is an illustration of cooperative (1) marketing, (2) credit, (3) consumption, (4) exchange ()
23. From a social standpoint, it is desirable that exchange take place, because it (1) gives work to those who handle the goods, (2) increases the productivity of a nation, (3) increases the circulation of money, (4) enables merchants to make a profit ()
24. Inelastic demand is best represented, among the following, by the demand for (1) salt, (2) shoes, (3) butter, (4) automobiles ()
25. An increase in the supply of a given commodity, the demand remaining the same, tends to bring about (1) an increase in price and an increase in quantity exchanged, (2) a decrease in price and a decrease in quantity exchanged, (3) a decrease in price and an

- increase in quantity exchanged, (4) an increase in price and a decrease in quantity exchanged. ()
26. Price is determined largely by custom rather than otherwise in the case of (1) postage stamps, (2) chewing gum, (3) fruit, (4) common labor. ()
27. Interference with the operation of the law of supply and demand may be said to occur in the case of (1) toll bridges, (2) private schools, (3) protective tariffs, (4) retail grocery stores. ()
28. Among the following kinds of land the greatest value, under ordinary circumstances, would be possessed by (1) meadow land, (2) grazing land, (3) desert land, (4) grain farming land. ()
29. Theoretically, the price at which a season's crop of wheat will sell will tend to be determined by the (1) cost of producing it, (2) amount which speculators are willing to pay for it, (3) amount of wheat left over from last year's wheat crop, (4) respective amounts of wheat which people will buy at all possible prices in relation to the size of the total available supply of wheat. ()
30. The indirect or fixed costs of production of an industrial enterprise are illustrated by expenditures for (1) lubricating oil, (2) railroad freight charges, (3) commissions paid to salesmen, (4) wages paid to a night watchman. ()
31. An economic service is rendered by stock exchanges in that they (1) provide the means of speculation, (2) help to establish a fair market price for stocks and bonds, (3) make it possible for some people to get rich quick, (4) guarantee the investment quality of all listed securities. ()
32. Of the following the best example of full legal tender in the United States today is the (1) silver dollar, (2) national bank note, (3) Federal Reserve note, (4) greenback. ()
33. The experience of the United States with bimetallism shows that (1) it is impossible to maintain such a system in actual operation for any length of time because of changes in the market prices of the respective metals, (2) bimetallism can be successful only in countries where silver is not mined, (3) it is possible for the government to establish by legislation the proper mint ratio between the metals, (4) the world's supply of gold is too large to permit bimetallism to function. ()
34. The chief social function performed by interest rates is to (1) afford the banks a profit, (2) make exchange possible, (3) give the largest possible returns to the owners of capital, (4) apportion capital among the various industries. ()
35. If the mint ratio between gold and silver under bimetallism is 18:1, gold will tend to be withdrawn from circulation if the market ratio becomes (1) 18:1, (2) 20:1, (3) 16:1, (4) any other ratio than 18:1. ()
36. Of the following, the group which suffers most from a considerable rise in the general price level consists of those who (1) live on pensions, (2) are working on a commission basis, (3) operate retail establishments, (4) work in factories. ()
37. An extended period of steadily falling prices tends to be economically harmful to the wage-earning class principally because (1) wage levels tend to fall faster than prices, (2) a large volume of unemployment usually appears, (3) urban centers tend to gain in population at the expense of rural districts, thus aggravating

- the serious condition of the wage earners, (4) immigrants enter in large numbers in order to enjoy the lowered costs of living . . . ()
38. Bank notes are more strictly protected by law than are bank deposits because bank notes (1) are engraved, while checks are merely written by hand, (2) are currency, while deposits are not, (3) exceed deposits in amount, (4) circulate throughout the country, while checks do not . . . ()
39. The safety of a bank is increased by (1) increasing the ratio of the cash reserves to deposits, (2) decreasing the ratio of the cash reserves to deposits, (3) increasing the ratio of loans to deposits, (4) increasing the rate of dividends to stockholders . . . ()
40. The increase in the demand for loanable funds would tend to be greatest in the case of (1) the discovery of new silver mines, (2) a great war, (3) the discovery of a cheaper process of making an article, (4) the invention of a new and superior article of consumption, as the automobile . . . ()
41. A group of American capitalists invest \$50,000,000 in South American industrial securities. The immediate effect of this action upon the rate of South American exchange in this country will be (1) a marked increase, (2) a slight increase, (3) a slight decrease, (4) no change . . . ()
42. The farmer's income is as low as it is chiefly because (1) he pays too high wages for labor, (2) he lives on his farm, (3) agricultural products are never protected by tariffs, (4) the volume of agricultural production is excessive . . . ()
43. In determining upon a fair scale of wages, boards of arbitration have been guided primarily by the (1) amount of effort exerted by the workers, (2) competitive value of the workers' services, (3) number of married men in the industry, (4) amount the employer is able to pay . . . ()
44. Of the following events, the one which would tend to lower the rent on apartments and dwelling houses in the average large city is (1) a shutting down of several large industries in the city, (2) an increase in the population of the city, (3) the development of a new and important industry, (4) a real estate boom promoted by the realtors of the city . . . ()
45. The dividends of most corporations are paid to the stockholders (1) as fast as they are made, (2) annually, (3) monthly, (4) quarterly . . . ()
46. An example of property classified as tangible property for purposes of taxation is (1) silver bullion, (2) a United States government bond, (3) a written contract, (4) an insurance policy . . . ()
47. The current public debt of the United States Government, compared with that outstanding in 1929, is (1) approximately the same, (2) considerably less, (3) considerably greater, (4) slightly less . . . ()
48. The merger movement has made least progress during the past ten years in the (1) radio industry, (2) baking industry, (3) moving picture industry, (4) coal industry . . . ()
49. Several separate plants producing the same product but under one management are said to constitute a (1) horizontal combination, (2) vertical combination, (3) monopoly, (4) holding company . . . ()

50. The placing of a tariff on wool imported into this country will (1) not affect the profits of sheep raisers, (2) necessarily benefit sheep raisers, (3) be likely to benefit sheep raisers, (4) prove detrimental to the interests of sheep raisers ()
51. Unionism has made relatively little progress among (1) plumbers, (2) carpenters, (3) miners, (4) retail clerks ()
52. The most effective of the following methods of curtailing child labor is that of (1) raising the general level of wages, (2) enforcing an industrial code forbidding child labor, (3) introducing more machinery, (4) shortening the hours of labor ()
53. In a period of falling prices a stockholder might logically expect a high rate of return if his corporation is (1) producing steel, (2) engaged in gold mining, (3) manufacturing agricultural implements, (4) engaged in silver mining ()
54. Of the two principal forms of whole life insurance, i.e., ordinary life and twenty-payment life, the latter form is especially suitable for a (1) college student with a dependent mother, (2) young man of 35 owning a rapidly expanding business and supporting a wife and three children, (3) doctor of 35 with a successful practice and supporting a wife and three children, (4) laboring man of 35 receiving relatively small wages and supporting a wife and three children ()
55. The shortest phase of the business cycle is the period of (1) crisis, (2) recovery, (3) depression, (4) prosperity ()

Number wrong 3) ————— Number right —————

Subtract —————

Score = Difference —————

TESTS OF INTEREST

As a sample of records of interests we present the Strong *Vocational Interest Blank* (for men). We have made a few verbal changes to facilitate printing it legibly on our small pages.

Group.....

Form A

Key number.....

Date.....

VOCATIONAL INTEREST BLANK

By EDWARD K. STRONG, JR.

Professor of Psychology, Stanford University

It is possible with a fair degree of accuracy to determine by this test whether one would like certain occupations or not. The test is not one of intelligence or school work. It measures the extent to which one's interests agree or disagree with those of successful men in a given profession.

Your responses will, of course, be held strictly confidential.

Name Age Sex

Occupation (e.g., Carpenter)..... Years of Experience.....

Just what do you do?.....

Name of Firm and Address.....

Address to which correspondence should be sent.....

Last grade reached in school (e.g., Grammar 6th, High School 2d, College 4th)

Did you select your present occupation or was it more or less thrust upon you?

Selected it..... Thrust upon me.....

What occupations, other than your present one, have you at one time or another engaged in?.....

What occupations have you frequently day-dreamed of entering?.....

Remarks

Before turning the page record the time (e.g., 10 minutes after 3 o'clock).....

Parts Ia and Ib. Occupations. Indicate after each occupation listed below whether you would like that kind of work or not. Disregard considerations of salary, social standing, future advancement, etc. Consider only whether you would like to do what is involved in the occupation.

Draw a circle around L if you like that kind of work.

Draw a circle around I if you are indifferent to that kind of work.

Draw a circle around D if you dislike that kind of work.

Work rapidly. Your first impressions are desired here. Answer all the items. Many of the seemingly trivial and irrelevant items are very useful in diagnosing your real attitude.

Actor (not movie)	L	I	D	Lawyer, Criminal	L	I	D
Advertiser	L	I	D	Lawyer, Corporation	L	I	D
Architect	L	I	D	Librarian	L	I	D
Army Officer	L	I	D	Life Insurance Salesman	L	I	D
Artist	L	I	D	Locomotive Engineer	L	I	D
Astronomer	L	I	D	Machinist	L	I	D
Athletic Director	L	I	D	Magazine Writer	L	I	D
Auctioneer	L	I	D	Manufacturer	L	I	D
Author of Novel	L	I	D	Marine Engineer	L	I	D
Author of Technical Book	L	I	D	Mechanical Engineer	L	I	D
Auto Salesman	L	I	D	Mining Superintendent	L	I	D
Auto Racer	L	I	D	Musician	L	I	D
Auto Repairman	L	I	D	Music Teacher	L	I	D
Aviator	L	I	D	Office Clerk	L	I	D
Bank Teller	L	I	D	Office Manager	L	I	D
Bookkeeper	L	I	D	Orchestra Conductor	L	I	D
Building Contractor	L	I	D	Pharmacist	L	I	D
Buyer of Merchandise	L	I	D	Photo Engraver	L	I	D
Carpenter	L	I	D	Physician	L	I	D
Cartoonist	L	I	D	Playground Director	L	I	D
Cashier in Bank	L	I	D	Poet	L	I	D
Certified Public Accountant	L	I	D	Politician	L	I	D
Chemist	L	I	D	Printer	L	I	D
Civil Engineer	L	I	D	Private Secretary	L	I	D
Civil Service Employee	L	I	D	Railway Conductor	L	I	D
Clergyman	L	I	D	Rancher	L	I	D
College Professor	L	I	D	Real Estate Salesman	L	I	D
Consul	L	I	D	Reporter, General	L	I	D
Dentist	L	I	D	Reporter, Sporting Page	L	I	D
Draftsman	L	I	D	Retailer	L	I	D
Editor	L	I	D	Sales Manager	L	I	D
Electrical Engineer	L	I	D	School Teacher	L	I	D
Employment Manager	L	I	D	Scientific Research Worker	L	I	D
Explorer	L	I	D	Sculptor	L	I	D
Factory Manager	L	I	D	Secretary, Chamber of Com.	L	I	D
Factory Worker	L	I	D	Secret Service Man	L	I	D
Farmer	L	I	D	Ship Officer	L	I	D
Floorwalker	L	I	D	Shop Foreman	L	I	D
Florist	L	I	D	Social Worker	L	I	D
Foreign Correspondent	L	I	D	Specialty Salesman	L	I	D
Governor of a State	L	I	D	Statistician	L	I	D
Hotel Keeper or Manager	L	I	D	Stock Broker	L	I	D
Interior Decorator	L	I	D	Surgeon	L	I	D
Interpreter	L	I	D	Toolmaker	L	I	D
Inventor	L	I	D	Traveling Salesman	L	I	D
Jeweler	L	I	D	Typist	L	I	D
Judge	L	I	D	Undertaker	L	I	D
Labor Arbitrator	L	I	D	Watchmaker	L	I	D
Laboratory Technician	L	I	D	Wholesaler	L	I	D
Landscape Gardener	L	I	D	Worker in Y. M. C. A., etc.	L	I	D

Part II. Amusements. Indicate in the same manner as in Part I whether you like the following or not. If in doubt, consider your most frequent attitude. *Work rapidly.* Do not think over various possibilities. Record your first impression.

Golf	L I D	Auctions	L I D
Fishing	L I D	Fortune tellers	L I D
Hunting	L I D	Animal zoos	L I D
Tennis	L I D	Art galleries	L I D
Driving an automobile	L I D	Museums	L I D
Taking long walks	L I D	Vaudeville	L I D
Boxing	L I D	Musical comedy	L I D
Checkers	L I D	Symphony concerts	L I D
Chess	L I D	Pet canaries	L I D
Poker	L I D	Pet monkeys	L I D
Bridge	L I D	Snakes	L I D
Solitaire	L I D	Sporting pages	L I D
Billiards	L I D	Poetry	L I D
Observing birds(nature study)	L I D	Detective stories	L I D
Solving mechanical puzzles	L I D	"Literary Digest"	L I D
Playing a musical instrument	L I D	"Life"	L I D
Doing sleight-of-hand	L I D	"New Republic"	L I D
Collecting postage stamps	L I D	"System"	L I D
Drilling in a company	L I D	"National Geographic Mag."	L I D
Chopping wood	L I D	"American Magazine"	L I D
Amusement parks	L I D	"Popular Mechanics"	L I D
Picnics	L I D	"Atlantic Monthly"	L I D
Excursions	L I D	"Arts and Crafts"	L I D
Smokers	L I D	Cowboy movies	L I D
"Rough house" initiations	L I D	Educational movies	L I D
Conventions	L I D	Travel movies	L I D
Full-dress affairs	L I D	Social problem movies	L I D

Part III. School Subjects. Indicate as in Part II your interest when in school.

Algebra	L I D	Mathematics	L I D
Agriculture	L I D	Manual Training	L I D
Arithmetic	L I D	Mechanical Drawing	L I D
Art	L I D	Military Drill	L I D
Bible Study	L I D	Music	L I D
Bookkeeping	L I D	Nature Study	L I D
Botany	L I D	Penmanship	L I D
Calculus	L I D	Philosophy	L I D
Chemistry	L I D	Physical Training	L I D
Civics	L I D	Physics	L I D
Dramatics	L I D	Psychology	L I D
Economics	L I D	Physiology	L I D
English Composition	L I D	Public Speaking	L I D
Geography	L I D	Shop Work	L I D
Geology	L I D	Shorthand	L I D
Geometry	L I D	Sociology	L I D
History	L I D	Spelling	L I D
Languages, ancient	L I D	Typewriting	L I D
Languages, modern	L I D	Zoölogy	L I D
Literature	L I D		

Part IV. *Activities.* Indicate your interests as in Part II.*Work rapidly.*

Repairing a clock	L	I	D
Making a radio set	L	I	D
Adjusting a carburetor	L	I	D
Repairing electrical wiring	L	I	D
Cabinetmaking	L	I	D
Operating machinery	L	I	D
Handling horses	L	I	D
Giving "first-aid" assistance	L	I	D
Raising flowers and vegetables	L	I	D
Decorating a room with flowers	L	I	D
Arguments	L	I	D
Interviewing men for a job	L	I	D
Interviewing prospects in selling	L	I	D
Interviewing clients	L	I	D
Making a speech	L	I	D
Organizing a play	L	I	D
Opening a conversation with a stranger	L	I	D
Teaching children	L	I	D
Teaching adults	L	I	D
Calling friends by nicknames	L	I	D
Being called by a nickname	L	I	D
Meeting and directing people	L	I	D
Taking responsibility	L	I	D
Meeting new situations	L	I	D
Adjusting difficulties of others	L	I	D
Drilling soldiers	L	I	D
Pursuing bandits in sheriff's posse	L	I	D
Doing research work	L	I	D
Acting as yell-leader	L	I	D
Writing personal letters	L	I	D
Writing reports	L	I	D
Entertaining others	L	I	D
Bargaining ("swapping")	L	I	D
Looking at shop windows	L	I	D
Buying merchandise for a store	L	I	D
Displaying merchandise in a store	L	I	D
Expressing judgments publicly regardless of criticism	L	I	D
Being pitted against another as in a political or athletic race	L	I	D
Being left to yourself	L	I	D
Methodical work	L	I	D
Regular hours for work	L	I	D
Continually changing activities	L	I	D
Continuing at same work until finished	L	I	D
Studying latest hobby, e.g., Einstein theory, Freud, etc.	L	I	D
Developing business systems	L	I	D
Saving money	L	I	D
Contributing to charities	L	I	D
Raising money for a charity	L	I	D
Living in the city	L	I	D
Climbing along edge of precipice	L	I	D
Looking at a collection of rare laces	L	I	D
Looking at a collection of antique furniture	L	I	D

Part V. *Peculiarities of People.* Record your first impression. Do not think of various possibilities or of exceptional cases. "Let yourself go" and record the feeling that comes to mind as you read the item.

Progressive people	L	I	D
Conservative people	L	I	D
Energetic people	L	I	D
Absent-minded people	L	I	D
People who borrow things	L	I	D
Quick-tempered people	L	I	D
Optimists	L	I	D
Pessimists	L	I	D
People who are natural leaders	L	I	D
People who assume leadership	L	I	D
People easily led	L	I	D
People who have made fortunes in business	L	I	D
Emotional people	L	I	D
Thrifty people	L	I	D
Spendthrifts	L	I	D
Talkative people	L	I	D
Religious people	L	I	D
Irreligious people	L	I	D
People who have done you favors	L	I	D
People who get rattled easily	L	I	D
Gruff men	L	I	D
Witty people	L	I	D
Foreigners	L	I	D
Negroes	L	I	D
Cautious people	L	I	D
Sick people	L	I	D
Nervous people	L	I	D
Very old people	L	I	D
Cripples	L	I	D
Side-show freaks	L	I	D
People with gold teeth	L	I	D
People with protruding jaws	L	I	D
People with hooked noses	L	I	D
Blind people	L	I	D
Deaf mutes	L	I	D
Self-conscious people	L	I	D
People who always agree with you	L	I	D
People who talk very loudly	L	I	D
People who talk very slowly	L	I	D
People who talk about themselves	L	I	D
Methodical people	L	I	D
Fashionably dressed people	L	I	D
Carelessly dressed people	L	I	D
People who do not believe in evolution	L	I	D
Socialists	L	I	D
Bolshevists	L	I	D
Independence in politics	L	I	D
Teetotalers	L	I	D
Men who chew tobacco	L	I	D
Women cleverer than you are	L	I	D
Men who use perfume	L	I	D
People who chew gum	L	I	D
Athletic men	L	I	D

Part VI. *Order of Preference of Activities.* Indicate which three of the following ten activities you would enjoy most by checking opposite them in column

one; also indicate which three you would enjoy least by checking opposite them in column two. Be sure to mark 3 in each column.

First 3 choices	Last 3 choices	
()	()	Develop the theory of operation of a new machine, e.g., auto
()	()	Operate (manipulate) the new machine
()	()	Discover an improvement in the design of the machine
()	()	Determine the cost of operation of the machine
()	()	Supervise the manufacture of the machine
()	()	Create a new artistic effect, i.e., improve the beauty of the auto
()	()	Sell the machine
()	()	Prepare the advertising for the machine
()	()	Teach others the use of the machine
()	()	Interest the public in the machine through public addresses

Indicate in the same way what you consider are the three most important factors affecting your work; also the three least important factors. Be sure to mark 3 in each column.

Most important 3 factors	Least important 3 factors	
()	()	Salary received for work
()	()	Steadiness and permanence of work
()	()	Opportunity for promotion
()	()	Courteous treatment from superiors
()	()	Opportunity to make use of all of one's knowledge and experience
()	()	Opportunity to ask questions and to consult about difficulties
()	()	Opportunity to understand just how one's superior expects work to be done
()	()	Certainty one's work will be judged by fair standards
()	()	Freedom in working out one's own methods of doing the work
()	()	Co-workers—congenial, competent, and adequate in number

Indicate in the same way the three men you would most like to have been; also the three you would least like to have been.

First 3 choices	Last 3 choices	
()	()	Luther Burbank, "plant wizard"
()	()	Enrico Caruso, singer
()	()	Thomas A. Edison, inventor
()	()	Henry Ford, manufacturer
()	()	Charles Dana Gibson, artist
()	()	J. P. Morgan, financier
()	()	J. J. Pershing, soldier
()	()	William H. Taft, jurist
()	()	Booth Tarkington, author
()	()	John Wanamaker, merchant

Indicate in the same way the three positions you would most prefer to hold in club or society; also the three you least prefer to hold.

First 3 choices	Last 3 choices	
()	()	President of a Society
()	()	Secretary of a Society
()	()	Treasurer of a Society
()	()	Member of a Society
()	()	Chairman, Arrangement Committee
()	()	Chairman, Educational Committee
()	()	Chairman, Entertainment Committee
()	()	Chairman, Membership Committee
()	()	Chairman, Program Committee
()	()	Chairman, Publicity Committee

Part VII. Comparison of Interest between Two Items. Indicate your choice of the following pairs by checking in the first space if you prefer the item to the left, in the second space if you like both equally well, and in the third space if you prefer the item to the right. Assume other things are equal except the two items to be compared.

Work rapidly.

Street-car motorman . . . . .	. . . . .	. . . . .	Street-car conductor
Policeman . . . . .	. . . . .	. . . . .	Fireman (fights fire)
Chauffeur . . . . .	. . . . .	. . . . .	Chef
Head waiter . . . . .	. . . . .	. . . . .	Lighthouse tender
House to house canvassing . . . . .	. . . . .	. . . . .	Retail selling
House to house canvassing . . . . .	. . . . .	. . . . .	Gardening
Repair auto . . . . .	. . . . .	. . . . .	Drive auto
Develop plans . . . . .	. . . . .	. . . . .	Execute plans
Do a job yourself . . . . .	. . . . .	. . . . .	Delegate job to another
Persuade others . . . . .	. . . . .	. . . . .	Order others
Deal with things . . . . .	. . . . .	. . . . .	Deal with people
Plan for immediate future . . . . .	. . . . .	. . . . .	Plan for five years ahead
Activity which produces tangible returns . . . . .	. . . . .	. . . . .	Activity which is enjoyed for its own sake
Taking a chance . . . . .	. . . . .	. . . . .	Playing safe
Definite salary . . . . .	. . . . .	. . . . .	Commission on what is done
Work for yourself . . . . .	. . . . .	. . . . .	Carry out general program of superior who is respected
Work which interests you, with modest income . . . . .	. . . . .	. . . . .	Work which does not interest you, with large income
Work in a large corporation with little chance of becoming president until age of 55 . . . . .	. . . . .	. . . . .	Work for self in small business
Selling article, quoted 10% below competitor . . . . .	. . . . .	. . . . .	Selling article, quoted 10% above competitor
Small pay, large opportunities to learn during next 5 years . . . . .	. . . . .	. . . . .	Good pay, little opportunity to learn during next 5 years
Outside work . . . . .	. . . . .	. . . . .	Work involving many details
Change from place to place . . . . .	. . . . .	. . . . .	Inside work
Great variety of work . . . . .	. . . . .	. . . . .	Working in one location
Physical activity . . . . .	. . . . .	. . . . .	Similarity in work
Emphasis upon quality of work . . . . .	. . . . .	. . . . .	Mental activity
Technical responsibility (head of a department of 25 people engaged in technical, research work) . . . . .	. . . . .	. . . . .	Emphasis upon quantity of work
Present a report in writing . . . . .	. . . . .	. . . . .	Supervisory responsibility (head of a department of 300 people engaged in typical business operation)
Listening to a story . . . . .	. . . . .	. . . . .	Present a report verbally
Playing baseball . . . . .	. . . . .	. . . . .	Telling a story
			Watching baseball

Amusement where there is a crowd	.....	.....	Amusement alone or with one or two others
Nights spent at home	.....	.....	Nights away from home
Reading a book	.....	.....	Going to movies
Belonging to many societies	.....	.....	Belonging to few societies
Few intimate friends	.....	.....	Many acquaintances
Many women friends	.....	.....	Few women friends
Fat men	.....	.....	Thin men
Tall men	.....	.....	Short men
Jealous people	.....	.....	Conceited people
Jealous people	.....	.....	Spendthrifts
People who talk very low	.....	.....	People who talk very loudly
People who talk very fast	.....	.....	People who talk very slowly

Part VIII. Rating of Present Abilities and Characteristics. Indicate below what kind of a person you are right now and what you have done. Check in the *first* column ("Yes") if the item really describes you, in the *third* column ("No") if the item does not describe you, and in the *second* column (?) if you are not sure. (Be frank in pointing out your weak points, for selection of a vocation must be made in terms of them as well as your strong points.)

	YES	?	NO
Usually start activities of my group
Usually drive myself steadily (do not work by fits and starts)
Win friends easily
Usually get other people to do what I want done
Usually liven up the group on a dull day
Am quite sure of myself
Accept just criticism without getting sore
Have mechanical ingenuity (inventiveness)
Have more than my share of novel ideas
Can carry out plans assigned by other people
Can discriminate between more or less important matters
Am inclined to keep silent (reticent) in confidential and semi-confidential affairs
Am always on time with my work
Remember faces, names, and incidents better than the average person
Can correct others without giving offense
Able to meet emergencies quickly and effectively
Get "rattled" easily
Can write a concise, well-organized report
Have good judgment in appraising values
Plan my work in detail

	YES	?	NO
Follow up subordinates effectively	()	()	()
Put drive into the organization	()	()	()
Stimulate the ambition of my associates	()	()	()
Show firmness without being easy	()	()	()
Win confidence and loyalty	()	()	()
Smooth out tangles and disagreements between people	()	()	()
Am approachable	()	()	()
Discuss my ideals with others	()	()	()
Worry considerably about mistakes	()	()	()
Feelings easily hurt	()	()	()
Usually ignore feelings of others	()	()	()
Loan money to acquaintances	()	()	()
Rebel inwardly at orders from another, obey when necessary	()	()	()
When caught in a mistake usually make excuses	()	()	()
Best-liked friends are superior to me in ability	()	()	()
Handle complaints without getting irritated	()	()	()
Borrow frequently (for personal use)	()	()	()
Tell jokes well	()	()	()
My advice sought by many	()	()	()
Frequently make wagers	()	()	()
Do not worry	()	()	()
Feelings rarely hurt	()	()	()
Carefully consider them	()	()	()
Rarely loan money	()	()	()
Enter into situation and enthusiastically carry out program	()	()	()
Practically never make excuses	()	()	()
Inferior in ability	()	()	()
Lose my temper at times	()	()	()
Practically never borrow	()	()	()
Practically never tell jokes	()	()	()
Practically never asked	()	()	()
Never make wagers	()	()	()
Worry very little	()	()	()
Feelings hurt sometimes	()	()	()
Consider them sometimes	()	()	()
Loan only to certain people	()	()	()
Carry out instructions with little or no feeling	()	()	()
Seldom make excuses	()	()	()
Equal in ability	()	()	()
Become annoyed at times	()	()	()
Borrow occasionally	()	()	()
Seldom tell jokes	()	()	()
Sought by few	()	()	()
Occasionally make wagers	()	()	()

Record the time when you finished this page.....

Number of minutes required to fill out the blank.....

Be Sure You Have Not Omitted Any Part. Note Particularly the Second Columns on Pages 213 and 214.

There are many tests and records which may be of value in various phases of adult education, and more are being made every year. Information about them may be found in:

- | | |
|---|---|
| Hildreth, G. H., '33, | Bibliography of mental tests and rating scales. |
| Russell, C., '30, | Standard tests. |
| Madsen, I. N., '30, | Educational measurements in the elementary school. |
| Ruch, G. M., and
Stoddard, G. P., '27, | Tests and measurements in high-school instruction. |
| Kinder, J. S., and
Odell, C. W., '30, | Educational tests for use in institutions of higher learning. |
| Symonds, P. M., '31, | Diagnosing personality and conduct. |
| Fryer, D., '31, | The measurement of interests in relation to human adjustment. |
| Kelley, T. L., '27, | Interpretation of educational measurements. |
| Kinder, M., '33, | The measurement of artistic abilities. |

APPENDIX VII

TESTS OF ABILITY TO UNDERSTAND LECTURES AND READINGS

PEOPLE tend to overestimate their comprehension of what they hear and what they read. Teachers of adults tend to overestimate the powers of comprehension possessed by their students. Consequently learning may be thwarted or impeded at the very outset. Any reader of this volume will find it instructive to have some friend read the paragraphs of Examination R to him one at a time, following the reading by testing him orally with the questions accompanying it and recording his choices of answers. When all eight paragraphs have been thus read and the answers to the test questions recorded, the results may be scored by the reader with the key shown on page 250. He may then profitably take the other examination (S) by reading the paragraphs and recording the answers selected, spending in all one hour (or more, if desired) upon the eight tasks; and score himself as before (the key for S is on page 251). He may profitably administer these examinations orally or in print to any person whom he has to educate. A table showing the significance of various scores as obtained in 60 minutes for the printed examination is presented on page 252.

The paragraphs used and degrees of comprehension required by the questions in Examinations R and S vary in difficulty from a little below to much above that found in ordinary lectures and references used for college classes. Examinations of the same sort, but much easier, are available in the ten forms of the Thorndike-McCall Reading Tests. Any teacher may inform himself of the ability of his students to understand what he says to them or the books he asks them to read by constructing similar examinations based on this special material.

R

PART III

THORNDIKE EXAMINATION
FOR
HIGH SCHOOL GRADUATES
FORM R

Write your name here very clearly.....

Read this page. Do nothing further until you are told to. Do not look at any other page of the examination until you are told to. When you are told to begin, turn over this page, and follow the printed directions. Work as fast as you can, but make no mistakes. If there is anything that you cannot do, leave it and go ahead to the next. Go back to it at the end if you have time. Do Test 1 first, then do Test 2, then do Test 3, and so on. At certain times you may be told by the examiner to begin on some test in advance of what you have reached. Obey his instructions promptly when they are given. Do not, however, wait for him to tell you to go on from one test to the next. Keep at work all the time. Go ahead as fast as you can, working accurately. If you finish the work of all the tests before time is called, go back and check your work for accuracy. Do not hand in your paper until the examiner says "Stop."

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By EDWARD L. THORNDIKE

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NEW YORK

TEST 1

Read these paragraphs. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraphs again as much as is necessary.

In England and many other modern States there is no difference in authority between one statute and another. All are made by the legislature: all can be changed by the legislature. What are called in England constitutional statutes, such as Magna Carta, the Bill of Rights, the Act of Settlement, the Acts of Union with Scotland and Ireland, are merely ordinary laws, which could be repealed by Parliament at any moment in exactly the same way as it can repeal a highway act or lower the duty on tobacco. The habit has grown up of talking of the British Constitution as if it were a fixed and definite thing. But there is in England no such thing as a Constitution apart from the rest of the law: for there is merely a mass of law, consisting partly of statutes and partly of decided cases and accepted usages, in conformity with which the government of the country

is carried on from day to day, but which is being constantly modified by fresh statutes and cases. The same thing existed in ancient Rome, and everywhere in Europe a century ago. It is, so to speak, the "natural," and used to be the normal condition of things in all countries, free or despotic.

The condition of America is wholly different. There the name Constitution designates a particular instrument adopted in 1788, amended in some points, since, which is the foundation of the national government. This Constitution was ratified and made binding not by Congress, but by the people acting through conventions assembled in the thirteen States which then composed the Confederation. It created a legislature of two houses but that legislature, which we call Congress, has no power to alter it in the smallest particular. That which the people have enacted, the people only can alter or repeal.

How does the Constitution of the United States differ from the ordinary laws of the United States?

1. Can be changed only by the people, not by Congress
2. Cannot be altered
3. Constitution is a particular instrument
4. It was not ratified by Congress
5. It gives expressed powers to the different authorities

How do the Constitutional Statutes of Great Britain differ from the ordinary laws of Great Britain?

6. Legislature can alter Constitutional Statutes
7. The law consists mainly of statutes
8. There is no great difference
9. There is only one mass of laws
10. They may be repealed

In what respect are Rome, European countries before 1800 and modern England stated to be alike?

11. Natural
12. They had no written laws
13. They lack a constitution
14. Their laws can be changed by Parliament
15. Their laws were constantly modified

What body has power to alter the Constitutional Statutes of England?

16. House of Commons
17. Parliament
18. The legislature

What body has power to alter the Constitution of the United States?

19. Congress
20. No body
21. The people

What power to amend the instrument adopted in 1788 have the two houses which pass laws for the United States?

22. None
23. None except to add amendments
24. They propose amendments to Congress

TEST 2

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

The geographical position of Sicily led almost as a matter of necessity to its historical position, as the meeting-place of the nations, the battle-field of contending races and creeds. For this reason, too, Sicily was never in historic times (nor, it seems, in prehistoric times either) the land of a single nation; her history exists mainly in its relation to the history of other lands. Lying nearer to the mainland of Europe and nearer to Africa than any other of the great Mediterranean islands, Sicily is, next to Spain, the connecting-link between those two quarters of the world. It stands also as a breakwater between the eastern and western divisions of the Mediterranean Sea. In prehistoric times these two divisions were two vast lakes, and Sicily is a surviving fragment of the land which once united the two continents. That Sicily and Africa were once joined we know only from modern scientific research; that Sicily and Italy were once joined is handed down in legend. Sicily then, comparatively near to Africa, but much nearer to Europe, has been a European land, but one specially open to invasion and settlement from Africa. It has been a part of western Europe, but a part which has had specially close relations with eastern Europe. It has stood at various times in close connection with Greece, Africa, and Spain; but its closer connection has been with Italy. Still the history of Sicily should never be looked on as simply part of the history of Italy.

What is suggested as a main cause of Sicilian history?

1. It has been a battle-field of races and creeds
2. Its geographical position
3. Its interrelations in a series of conflicts
4. Its proximity to Italy and Africa

What two facts about Sicily's location are of special importance?

5. It has been a battle-field of races and creeds
6. It has been a part of western Europe
7. It is a breakwater between the eastern Mediterranean and the western
8. It is the link between Europe and Africa

Against what too narrow view of the history of Sicily is the reader warned?

9. Not to associate the history of Sicily with the history of Italy
10. Sicily has been only a battle-field
11. Sicilian history is simply a part of Italian history
12. Sicily is merely a part of Italy

It is possible that a correlation may be made between solubility and the energy of surface tension. If a solid is immersed in a liquid a certain part of the energy of the system depends on, and is proportional to, the area of contact between solid and liquid. Similarly with two liquids like oil and water, which do not mix, we have surface energy proportional to the area of contact. Equilibrium requires that the available energy and therefore the area of contact should be a minimum, as is demonstrated in Plateau's beautiful experiment, where a large drop of oil is placed in a liquid of equal

density and a perfect sphere is formed. If, however, the energy of surface tension between the two substances were negative the surface would tend to a maximum, and complete mixture would follow. From this point of view the natural solubility of two substances involves a negative energy of surface tension between them.

Out of what is the perfect sphere formed?

13. A drop of oil in a liquid of equal density
14. Area of contact should be a minimum
15. Perfect equilibrium
16. Surface tension

Complete this sentence so as to make it harmonize with the facts of the paragraph.

In complete solubility of B in A the area of contact between B and A is.....

17. a maximum
18. dependent on the surface energy
19. negative
20. proportional
21. A/B

What is the condition of the energy of surface tension between two liquids A and B if A is to mix with B completely?

22. Equilibrium
23. Negative
24. No surface energy
25. Proportional
26. Zero

TEST 3

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

Though the spar torpedo had scored some successes, it was mainly because the means of defense against it at that time were inefficient. The ship trusted solely to her heavy gun and rifle fire to repel the attack. The noise, smoke, and difficulty of hitting a small object at night with a piece that could probably be discharged but once before the boat arrived, while rifle bullets would not stop its advance, favored the attack. When a number of small guns and electric lights were added to a ship's equipment, success with an outrigger torpedo became nearly, if not entirely, impossible. Attention was then turned in the direction of giving motion to the torpedo and steering it to the required point by electric wires worked from the shore or from another vessel; or, dispensing with any such connection, of devising a torpedo which would travel under water in a given direction by means of self-contained motive power and machinery. Of the former type are the Lay, Sims-Edison and Brennan torpedoes. The first two — electrically steered by a wire which trails behind the torpedo — have insufficient speed to be of practical value, and are no longer used. The Brennan torpedo, carrying a charge of explosive, travels under water and is propelled by unwinding two drums or reels of fine steel wire within the torpedo. The rotation of these reels is communicated to the propellers,

causing the torpedo to advance. The ends of the wires are connected to an engine on shore to give rapid unwinding and increased speed to the torpedo. It is steered by varying the speed of unwinding the two wires. This torpedo was adopted by the British war office for harbor defense and the protection of narrow channels.

What other word is used in the paragraph with the same meaning as spar?

1. Brennan
2. Outrigger
3. Piece
4. Reel

What advantage over a rifle has a small gun in repelling spar torpedo attacks?

5. Faster and more powerful
6. Gun could stop the advance of the boat
7. More shots can be fired
8. Noise and smoke
9. Rifle bullets no result

When the spar torpedo was abandoned to what lines did invention betake itself. (Check two.)

10. Control by wires
11. Increasing speed
12. Motion for the torpedo
13. Outrigger torpedoes
14. Steering for the torpedo

What was the difficulty with the Sims-Edison torpedo?

15. Had to be steered from the shore
16. Insufficient speed
17. The propeller

Why did the Brennan torpedo have two propellers?

18. For the sake of speed
19. It was steered by varying the rates of the propellers
20. Rotation causes advance
21. There were two reels
22. To keep the torpedo submerged

Could the Brennan torpedo be controlled from a ship?

23. Yes
24. No

What use of it was made by the British war department?

25. Harbor defense
26. In battles
27. Slight

Do you think it was the army or the navy that used it?

28. Army
29. Navy
30. Yes

TEST 4

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

The second class of early French epics consists of the Arthurian cycle, the *Matière de Bretagne*, the earliest known compositions of which are at least a century junior to the earliest *chanson de geste*, but which soon succeeded the chansons in popular favor, and obtained a vogue both wider and far more enduring. It is not easy to conceive a greater contrast in form, style, subject and sentiment than is presented by the two classes. In both the religious sentiment is prominent, but the religion of the chansons is of the simplest, not to say of the most savage character. To pray to God and to kill his enemies constitutes the whole duty of man. In the romances the mystical element becomes on the contrary prominent, and furnishes, in the Holy Grail, one of the most important features. In the Carolingian knight the courtesy and clemency which we have learnt to associate with chivalry are almost entirely absent. The *gentil ber* contradicts, jeers at, and execrates his sovereign and his fellows with the utmost freedom. He thinks nothing of striking his *cortoise moullier* so that the blood runs down her *cler vis*. If a servant or even an equal offends him, he will throw the offender into the fire, knock his brains out, or set his whiskers ablaze. The Arthurian knight is far more of the modern model in these respects.

The paragraph is in the main a contrast of two things. What are they?

1. Chivalry and the religious element
2. Epic and romance
3. The Arthurian knight and the Carolingian knight
4. The Arthurian romance and the chansons de geste

Which was liked by more people?

5. Carolingian
6. Chansons de geste
7. Chivalry
8. Epic
9. Religion
10. The Arthurian romances

Which was more refined?

11. Carolingian
12. Chansons de geste
13. Chivalry
14. Epic
15. Religion
16. The Arthurian romances

State the difference in respect to religion by checking the pair of words which best fills the blank spaces. The religion of one was....., of the other.....

- | | |
|------------|------------|
| 17. savage | element |
| 18. savage | courteous |
| 19. savage | mystical |
| 20. simple | complex |
| 21. simple | mysterious |
| 22. simple | prominent |

What word is paired with Arthurian in the contrast?

23. Carlovingian
24. Chansons
25. Chivalry
26. Gentix
27. Geste
28. Knight

What phrase is paired with Arthurian cycle?

29. Chansons de geste
30. Early French epics
31. Matière de Bretagne
32. Mystical

Form, style, subject and sentiment; — which of these are not touched on in the paragraph?

33. All are touched on
34. Sentiment
35. Style
36. Subject

What does each of these mean as used in the paragraph?

a. junior to

37. Earlier than
38. Later than
39. Previous to

b. moullier

40. Horse
41. Miller
42. Mule
43. Woman

c. What do you think may probably have been the topic of the paragraph preceding this?

44. Carlovingian cycle
45. Chansons de geste
46. Romance in more detail
47. An earlier period of writing

TEST 5

Read this paragraph. Then read the questions. Make a check (✓) before the best answer for each question. Read the paragraph again as much as is necessary.

In the 17th century the religious orders and especially the Jesuits absorbed even more of the activities and counted for more in the public affairs of Portugal than in the preceding age. The pulpit discharged some of the functions of the modern press, and men who combined the gifts of oratory and writing filled it and distinguished themselves, their order and their country. The Jesuit Antonio Vieira, missionary, diplomat and voluminous writer, repeated the triumphs he had gained in Bahia and Lisbon in Rome, which proclaimed him the prince of Catholic orators. His 200 sermons are a mine of learning and experience, and they stand out from all others by their imaginative power, originality of view, variety of treatment and audacity of expression. His letters are in a simple conversational style, but they lack the popular locutions, humor and individuality of those of Mello. Vieira was a man of action, while the oratorian Manoel Bernardes lived as a recluse, hence his sermons and devotional works, especially *Luz e Calor* and the *Nova Floresta* breathe a calm and sweetness alien to the other, while they are even richer treasures of pure Portuguese. Perhaps the truest and most feeling human documents of the century are the five epistles written by Marianna Alcoforado, known to history as the *Letters of a Portuguese Nun*. Padre Ferreira de Almeida's translation of the Bible has considerable linguistic importance, and philological studies had an able exponent in Amaro de Roboredo.

Which of these is the best title for the paragraph?

1. Vieira
2. The literature of Portugal in the 17th century
3. The contribution of the church to the literature of Portugal
4. The contribution of the church to the literature of Portugal in the 17th century
5. Oratory in the 17th century

Who or what are contrasted in the paragraph?

6. Monks and priests
7. Vieira and Bernardes
8. Vieira and Mello

Who or what are compared in the paragraph?

9. Force and expression
10. Letters of Vieira and letters of Mello
11. Sermons versus letters
12. Vieira and Alcoforado
13. Vieira and Bernardes

Do you think Vieira was a typical priest?

14. Yes
15. No

Do you think Vieira's 200 sermons were printed?

16. Yes

17. No

Do you think the religious orders counted for little in the public affairs of Portugal in the 16th century?

18. Yes

19. No

What evidence is given in the paragraph that Portugal in the 17th century stood well in comparison with other countries in respect to oratory?

20. Distinguished themselves, their order and their country

21. Portugal counted for more than in the preceding age

22. The truest documents of the century

23. Vieira was proclaimed the prince of Catholic orators at Rome

Of the writers mentioned which do you think may have occasionally shocked their readers. (Check two.)

24. Alcoforado

25. Almeida

26. Bernardes

27. de Roboredo

28. Mello

29. Vieira

Which may not have belonged to any religious order? (Check two.)

30. Alcoforado

31. Almeida

32. Bernardes

33. de Roboredo

34. Mello

35. Vieira

What does locutions mean as used in the paragraph?

36. Elocutions

37. Expressions

38. Sermons

39. Writings

What does recluse mean as used in the paragraph?

40. hermit

41. monk

42. retreat

What does exponent mean as used in the paragraph?

43. leader

44. part of

45. representative

46. writer

TEST 6

Read the paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

REFEREE, a person to whom anything is referred; an arbitrator. The court of referees in England was a court to which the House of Commons committed the decision of all questions as to the right of petitioners to be heard in opposition to private bills. As originally constituted the referees consisted of the chairman of ways and means, the other members, the Speaker's counsel and several official referees not members of the House of Commons. In 1903 the appointment of official referees was discontinued. The court now consists of the chairman of ways and means, the deputy chairman and not less than seven other members of the House appointed by the Speaker, and its duty, as defined by a standing order, is to decide upon all petitions against private bills, or against provisional orders or provisional certificates, as to the rights of the petitioners to be heard upon such petitions. In the high court of justice, under the Judicature Act 1873, cases may be submitted to three official referees, for trial, inquiry and report, or assessment of damages. Inquiry and report may be directed in any case, trial only by consent of the parties, or in any matter requiring any prolonged examination of documents or accounts, or any scientific or local investigation which can not be tried in the ordinary way.

What synonym is used for "referee"?

1. arbitrator
2. judicature
3. court

In what country, do you think, does the high court of justice sit?

4. Any country
5. England
6. United States

Would it have been correct before 1903 to speak of the chairman of ways and means as a member of the court of referees ex officio?

7. Yes
8. No

Would it be correct to speak of him so now?

9. Yes
10. No

Does the court of referees decide the merits of petitions against public bills?

11. Yes
12. No

Against private bills?

13. Yes
14. No

Does it decide whether provisional certificates shall be withheld?

16. Yes
17. No

What is necessary besides the decision of the high court of justice before a case at law can be tried by referees?

18. Assessment of damages
19. Consent of the parties
20. Decision of the referees
21. Inquiry and report

What limitation is now set to the number of members of the court of referees?

22. Not less than 9
23. Not less than 7
24. Three
25. Ten at least

What do you think is the "ordinary way" mentioned in the last line of the paragraph?

26. An ordinary court trial
27. By decision of the justice
28. By jury
29. By the House of Commons

TEST 7

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

In the terminology of the Domesday Inquest we find the villeins as the most numerous elements of the English population. Out of about 240,000 households enumerated in Domesday 100,000 are marked as belonging to villeins. They are rustics performing, as a rule, work services for their lords. But not all the inhabitants of the villages were designated by that name. Villeins are opposed to socmen and freemen on one hand, to *bordarii*, cottagers and slaves on the other. The distinction in regard to the first two of these groups was evidently derived from their greater freedom, although the difference is only one in degree and not in kind. In fact, the villein is assumed to be a person free by birth, but holding land of which he cannot dispose freely. The distinction as against *bordarii* and cottagers is based on the size of the holding: the villeins and holders of regular shares in the village — that is, of the virgates, bovates or half-hides which constitute the principal subdivisions in the fields and contribute to form the ploughteams — whereas the *bordarii* hold smaller plots of some 5 acres, more or less, and *cottarii* are connected with mere cottages and crofts. Thus the terminology of Domesday takes note of two kinds of differences in the status of rustics: a legal one in connection with the right to dispose of property in land, and an economic one reflecting the opposition between the holders of shares in the fields and the holders of auxiliary tenements. The feature of personal serfdom is also noticeable, but it provides a basis only for the comparatively small group of *servi*, of whom only about 25,000 are enumerated in Domesday Book. The contrast between this exceptionally situated class and the rest of the population shows that personal slavery was rapidly disappearing in England about the time of the Conquest. It is also to be noticed that the Domesday Survey constantly mentions the *terra villanorum* as opposed to the demesne of the estates or manors of the time, and that the land of the rustics is taxed separately for the gold, so that distinction between the property of the lord and that of

the peasant dependent on him is clearly marked by no means devoid of practical importance.

Which would you choose as the best title for this paragraph?

1. Serfdom in England
2. The Domesday inquest
3. The Status of the Villein at the time of the Norman Conquest
4. Socman, freeman and villein

Were the villeins personal serfs?

5. Yes
6. No
7. Sometimes

What sort of services did the villeins perform for their lords?

8. Agricultural labor
9. Household work
10. Land-rental services

What is the name of the class who held shares in the fields?

11. Villeins
12. Socmen
13. Freemen
14. Bordarii
15. Cottagers
16. Slaves

What is the name of a class who held auxiliary tenements?

17. Villeins
18. Socmen
19. Freemen
20. Bordarii
21. Servi

What is the largest measure of land mentioned in the paragraph?

22. Bovate
23. Half-hide
24. 5 acres
25. Ploughteam
26. Virgate

Which of these do you think would be nearest to the number of personal serfs in England 50 years before the Domesday Survey?

27. 5,000
28. 15,000
29. 25,000
30. 35,000

Did a villein usually pay rent?

31. Yes
32. No

Did a villein usually pay taxes on his land?

33. Yes
34. No

Could a villein sell his land?

35. Yes
36. No

TEST 8

Read the paragraphs. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraphs again as much as is necessary.

A silk "throwster" receives his silk in skein form, the thread of which consists of a number of silk fibres wound together to make a certain diameter or size, the separate fiber having actually been spun by the worm, and this fibre may measure anything from 500 to 1,000 yards in length. The silk-waste spinner receives his silk in quite a different form: merely the raw material, packed in bales of various sizes and weights, the contents being a much tangled mass of all lengths of fibre mixed with much foreign matter, such as ends of straws, twigs, leaves, worms, and chrysalis. It is the spinner's business to straighten out these fibres, with the aid of machinery, and then so to join them that they become a thread, which is known as spun silk.

There are two distinct kinds of spun silk — one called "schappe" and the other "spun silk" or "discharged spun silk." All silk produced by the worm is composed of two substances — fibroin, the true thread, and sericin, which is a hard, gummy coating of the "fibroin." Before the silk can be manipulated by machinery to any advantage, the gum coating must be removed, really dissolved, and washed away — and according to the method used in achieving this operation the result is either a "schappe" or a "discharged yarn." The former, "schapping," is the French, Italian and Swiss method, from which the silk when finished is neither so bright nor so good in color as the "discharged silk" but it is very clean and level, and for some purposes absolutely essential, as, for instance, in velvet manufacture.

Schapping — The method is as follows: If waste silk is piled in a heap in a damp, warm place, and kept moist and warm, the gum will in a few days' time begin to ferment and loosen, and can then be washed off, leaving the true thread soft and supple; but the smell caused by the fermentation is so offensive that it cannot be practiced in or near towns. Therefore schappe spinners place their degumming plant in the hills, near or on a stream of pure water. The waste silk is put into large kilns and covered with hot water (temperature 170° F). These are then hermetically closed, and left for a few hours for the gum to ferment and loosen. When thoroughly softened — the time occupied depending on the heat of the water and nature of the silk — the contents of the kiln are taken out and placed into vats of hot water, and allowed to soak there for some time. Thence the silk is taken to a washing machine, and the loosened gum thoroughly washed away. The silk is then partly dried in a hydro-extractor, and afterwards put in rooms heated by steam-pipes, where the drying is completed.

Which is shorter, silk waste or ordinary silk fibre?

1. Silk fibre
2. Silk waste

Which is cleaner, silk waste or ordinary silk fibre?

3. Silk fibre
4. Silk waste

Which requires the more further work?

- 5. Silk fibre
- 6. Silk waste

Which do you judge is more valuable per pound, spun silk or thrown silk?

- 7. Spun silk
- 8. Thrown silk

What is the basis of distinction between the two varieties of spun silk?

- 9. Color and cleanness
- 10. Method of removing the gum coating
- 11. Method of treatment
- 12. Schapping

Which of these statements gives the merits of each?

- 13. Schappe is clean and level. Discharged silk is brighter and of better color
- 14. Schappe is clean and cheaper. Discharged silk is brighter
- 15. Schappe is good for velvets. Discharged silk is clean
- 16. Schapping makes it level. Discharging makes it glossy

Why is a schappe plant located in the hills?

- 17. Because of the cost
- 18. Because of the climate
- 19. Because of the smell

Why is it located near a stream?

- 20. Much water is required to remove the smell
- 21. Much water is required to treat the silk

Do you judge that silk naturally absorbs much or little water?

- 22. Much
- 23. Little
- 24. Yes

Do you judge that schapping is a process older or newer than "throwing" silk?

- 25. Older
- 26. Newer
- 27. Yes

Why?

- 28. It utilizes waste that is unsuitable for throwing
- 29. The use of steam
- 30. The use of the hydro-extractor

S

PART III

THORNDIKE EXAMINATION
FOR
HIGH SCHOOL GRADUATES
FORM S

Write your name here very clearly.....

Read this page. Do nothing further until you are told to. Do not look at any other page of the examination until you are told to. When you are told to begin, turn over this page, and follow the printed directions. Work as fast as you can, but make no mistakes. If there is anything that you cannot do, leave it and go ahead to the next. Go back to it at the end if you have time. Do Test 1 first, then do Test 2, then do Test 3, and so on. At certain times you may be told by the examiner to begin on some test in advance of what you have reached. Obey his instructions promptly when they are given. Do not, however, wait for him to tell you to go on from one test to the next. Keep at work all the time. Go ahead as fast as you can, working accurately. If you finish the work of all the tests before time is called, go back and check your work for accuracy. Do not hand in your paper until the examiner says, "Stop."

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BY EDWARD L. THORNDIKE

BUREAU OF PUBLICATIONS
TEACHERS COLLEGE, COLUMBIA UNIVERSITY
NEW YORK

TEST 1

Read this paragraph. Then read the questions. Make a (✓) check before the best answer to each question. Read the paragraph again as much as is necessary.

The custom of constructing barrows or mounds of stone or earth over the remains of the dead was a characteristic feature of the sepulchral systems of primitive times. Originating in the common sentiment of humanity which desires by some visible memorial to honor and perpetuate the memory of the dead, it was practiced alike by peoples of high and low development, and continued through all the stages of culture that preceded the introduction of Christianity. The primary idea of sepulchre appears to have been the provision of habitation for the dead and thus, in its perfect form, the barrow included a chamber or chambers where the tenant was surrounded with the prized possessions of his previous life. A common feature of the earlier barrows is the enclosing fence, which marked off the site from the surrounding ground. When the barrow was of earth, this

was effected by an encircling trench or a low vallum. When the barrow was of stone structure, the enclosure was usually a circle of standing stones. Sometimes, instead of a chamber formed above the ground, the barrow covered a pit excavated for the interment under the original surface. In later times the mound itself was frequently dispensed with, and the interments made within the enclosure of a trench, a vallum or a circle of standing stones. Usually the great barrows occupy conspicuous sites but in general the external form is no index to the internal construction and gives no definite indication of the nature of the sepulchral usages. Thus, while the long barrow is characteristic of the Stone Age, it is impossible to tell without direct examination whether it may be chambered or unchambered, or whether burials within may be those of burnt or unburnt bodies.

Was the custom of building barrows over the remains of the dead common or rare in primitive times?

1. Yes
2. No
3. Common
4. Rare

What put an end to the construction of barrows?

5. Burning of the bodies
6. Idea of eternal life
7. Interments
8. Introduction of Christianity
9. Mounds

What desire is stated to have been the source of building barrows?

10. A common sentiment
11. That of peoples of high and low development
12. To honor the dead and keep them in memory
13. To provide a place for the dead
14. To prepare for the needs of a future life

What is offered in the paragraph as evidence that in primitive times a sepulchre meant a place for a dead man to live in?

15. Chambers were built in the barrows
16. Description of the barrows
17. Food was buried with the dead man
18. His clothes, tools, weapons, etc., were buried with the dead man
19. Nothing is offered

What word is used for a wall or bunker of dirt?

20. Barrow
21. Fence
22. Interment
23. Mound
24. Vallum

What three forms did the fence enclosing the barrow take. (Write in the words.)

25. _____
26. _____
27. _____

Can the internal construction of a barrow be inferred from its external form?

28. Yes
29. Generally
30. Not as a rule
31. Not often
32. Never

Was the chamber always built above ground?

33. Yes
34. No

TEST 2

Read these paragraphs. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

The study of village communities has become one of the fundamental methods of discussing the ancient history of institutions. It would be out of the question here to range over the whole field of human society in search for communal arrangements of rural life. It will be sufficient to confine the present inquiry to the varieties presented by nations of Aryan race, not because greater importance is to be attached to these nations than to other branches of humankind, although this view might also be reasonably urged, but principally because the Aryan race in its history has gone through all sorts of experiences, and the data gathered from its historical life can be tolerably well ascertained. Should the road be sufficiently cleared in this particular direction, it will not be difficult to connect the results with similar researches in other racial surroundings.

The best way seems to be to select some typical examples, chiefly from the domain of Celtic, Slavonic and Germanic social history, and to try to interpret them in regard to the general conditions in which communal institutions originate, grow and decay. As the principal problem will consist in ascertaining how far land was held in common instead of being held, as is usual at present, by individuals, it is advisable to look out for instances in which this element of holding in common is very clearly expressed. We ought to get, as it were, acclimatized to the mental atmosphere of such social arrangement in order to counteract a very natural but most pernicious bent prompting one to apply to the conditions of the past the key of our modern views and habitual notions. A certain acquaintance with the structure of Celtic society, more especially the society of ancient Wales, is likely to make it clear from the outset to what extent the husbandry and law of an Aryan race may depend on institutions in which the individual factor is greatly reduced, while the union first of kinsmen and then of neighbors plays a most decisive part.

Do you think that these paragraphs come at the beginning, the middle or the end of an article?

1. Beginning
2. Middle
3. End
4. Yes
5. No

What do you think is the best title for the article?

6. The Aryan race
7. Celtic, Slavonic and Germanic history
8. Village communities
9. The ancient history of institutions

To what sort of nations does the author restrict his inquiry?

10. Aryan
11. European
12. Monarchical
13. Nations with early civilization
14. Nations which have passed through many experiences
15. Small ancient nations

According to the paragraph, would it be reasonable to assert that greater importance is to be attached to the Aryan nations than to others?

16. Yes
17. No

According to the paragraph is it desirable to try to explain the social conditions of the past by the ideas of the present time?

18. Yes
19. No

What two reasons are given in justification of the author's limitation of his inquiry? (Check two.)

20. Greater importance is attached to them
21. Must get mental atmosphere
22. Selection of typical examples
23. The Aryan race has gone through all sorts of experiences
24. The data about the Aryans are fairly exact
25. The road is sufficiently cleared

Who were the common owners in cases where land was held in common?

26. All the people
27. Celtic, Slavonic and Germanic
28. Groups of people
29. Relatives or neighbors
30. The first owners
31. The nobility

TEST 3

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

The name destructors is applied by English municipal engineers to furnaces, or combinations of furnaces, constructed for the purpose of disposing by burning of town refuse, which is a heterogeneous mass of material, including, besides general household and ash-bin refuse, small quantities of garden refuse, trade refuse, market refuse and often street sweepings. The mere disposal of this material is not, however, by any means the only consideration in dealing with it upon the destructor system. For many years past scientific experts, municipal engineers and public authorities have been directing careful attention to the utilization of refuse

as fuel for steam production, and such progress in this direction has been made that in many towns its calorific value is now being utilized daily for motive-power purposes. On the other hand, that proper degree of caution which is obtained only by actual experience must be exercised in the application of refuse fuel to steam-raising. When its value as a low-class fuel was first recognized, the idea was disseminated that the refuse of a given population was of itself sufficient to develop the necessary steam-power for supplying that population with the electric light. The economical importance of a combined destructor and electric undertaking of this character naturally presented a somewhat fascinating stimulus to public authorities, and possibly had much to do with the development both of the adoption of the principle of dealing with refuse by fire, and lighting towns by electricity. However true this may be as the statement of a theoretical scientific fact, experience so far does not show it to be a basis upon which engineers may venture to calculate, although, as will be seen later, under certain circumstances of equalized load, which must be considered upon their merits in each case, a well-designed destructor plant can be made to perform valuable commercial service to an electric or other power-using undertaking. Further, when a system, thermal or otherwise, for the storage of energy can be introduced and applied in a trustworthy and economical manner, the degree of advantage to be derived from the utilization of the waste heat from destructors will be materially enhanced.

What does a destructor do besides get rid of the refuse of a town?

1. Burns it
2. Prepares the refuse as a low grade fuel
3. Provides power
4. Stores energy

What misleading statement was spread abroad in connection with the early notions of the value of refuse as fuel?

5. A system for the storage of energy is of little value
6. A town's refuse would supply all necessary heat
7. A town's refuse was of little value
8. A town's refuse would provide light for the town

What does "combined destructor and electric undertaking" mean?

9. A plant for burning refuse and generating electricity
10. Combining the destruction of refuse with the development of power to furnish electricity
11. Conversion of the heat from refuse into electricity
12. Undertaking to combine a destructor and electricity

What load was it that is equalized?

13. Electric usage
14. The heat that is necessary
15. The operation of the destructor
16. The refuse

What is the relation of equalized load to the practicability of a destructor?

17. Destructor cannot provide a steady current
18. Direct relation
19. Increases it
20. Valuable

What different groups of men are stated to have considered the problem of using refuse as a source of energy? (Check three.)

21. Disseminators of ideas
22. Englishmen
23. Municipal engineers
24. Public authorities
25. Scientists
26. Street sweepers
27. The population

Define "calorific."

28. Heating
29. Heat qualities
30. Pertaining to heat units
31. Pertaining to temperature
32. Measure of power

Define "thermal."

33. Heat
34. Heat-conserving
35. Pertaining to heat
36. Stored energy

Define "enhanced."

37. Fixed
38. Increased
39. Improved
40. Made certain

TEST 4

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

In the history of the French Revolution the influence which it exerted upon the surrounding countries demands peculiar attention. The French professed to act upon principles of universal authority, and from an early date they began to seek converts outside their own limits. The effect was slight upon England, which had already secured most of the reforms desired by the French, and upon Spain, where the bulk of the people were entirely submissive to church and king. But in the Netherlands, in western Germany and in northern Italy, countries which had attained a degree of civilization resembling that of France, where the middle and lower classes had grievances and aspirations not very different from those of the French, the effect was profound. Fear of revolution at home was one of the motives which led continental sovereigns to attack revolution in France. Their incoherent efforts only confirmed the Jacobin supremacy. Wherever the victorious French extended their dominion, they remodelled institutions in the French manner. Their sway proved so oppressive that the very classes which had welcomed them with most fervor soon came to long for their expulsion. But revolutionary ideas kept their charm. Under Napoleon the essential part of the changes made by the Republic was preserved in these countries also. Moreover the effacement of old boundaries, the overthrow of ancestral governments, and the invocation, however hollow, of the sovereignty of the people, awoke national feeling which had

slumbered long and prepared for the struggle for national union and independence in the 19th century.

What is a good title for the paragraph?

1. The French revolution
2. The history of the French revolution
3. The influence of the French revolution on the surrounding countries
4. The significance of the French revolution

What were the Jacobins?

5. Aristocrats
6. Converts
7. Kings
8. Revolutionists

What two countries were alike in respect to the magnitude of the results of French revolutionary propaganda?

9. England and France
10. England and Germany
11. England and Italy
12. England and the Netherlands
13. England and Spain

What two countries were different in respect to the reasons why the French revolutionary propaganda had certain results?

14. The Netherlands and western Germany
15. The Netherlands and northern Italy
16. The Netherlands and England
17. Spain and England
18. Spain and Italy

What distinction is noted between the attitude toward the ideas advocated by the French and that toward the governmental practices associated therewith?

19. Held the government idea, but abhorred the practices
20. Institutions were remodelled in the French manner
21. The French were cheered as revolutionists, but condemned as oppressors
22. The ideas were welcomed; the practices were disliked

State in the words of the paragraph one of the "principles of universal authority."

23. National feeling
24. Remodelled institutions
25. Revolutionary ideas
26. The sovereignty of the people
27. To seek converts

What facts are specified as stimuli to sentiments and actions along the line of the self determination of peoples? (Check three.)

28. Fear of revolution
29. Jacobin supremacy
30. Universal authority
31. The attention to popular rights
32. The obliteration of old boundaries
33. The downfall of dynasties

TEST 5

Read these paragraphs. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraphs again as much as is necessary.

ELDER, the name given at different times to a ruler or officer in certain political and ecclesiastical systems of government.

The office of elder is in its origin political and is a relic of the old patriarchal system. The unit of primitive society is always the family; the only tie that binds men together is that of kinship. "The eldest male parent," to quote Sir Henry Maine, "is absolutely supreme in his household. His dominion extends to life and death and is as unqualified over his children and their houses as over his slaves." The tribe, which is a later development, is always an aggregate of families or clans, not a collection of individuals. "The union of several clans for common political action," as Robertson Smith says, "was produced by the pressure of practical necessity, and always tended towards dissolution when this practical pressure was withdrawn. The only organization for common action was that the leading men of the clan consulted together in time of need, and their influence led the masses with them. Out of these conferences arose the senates of elders found in the ancient states of Semitic and Aryan antiquity alike." With the development of civilization there came a time when age ceased to be an indispensable condition of leadership. The old title was, however, generally retained.

The name "elder" was probably the first title bestowed upon the officers of the Christian Church — since the word deacon does not occur in connection with the appointment of the Seven in Acts vi. Its universal adoption is due not only to its currency amongst the Jews, but also to the fact that it was frequently used as the title of magistrates in the cities and villages of Asia Minor. For the history of the office of elder in the early Church and the relation between elders and bishops, see *Presbyter*.

In modern times the use of the term is almost entirely confined to the Presbyterian church, the officers of which are always called elders. According to the Presbyterian theory of church government there are two classes of elders — "teaching elders," or those specially set apart to the pastoral office, and "ruling elders," who are laymen, chosen generally by the congregation and set apart by ordination to be associated with the pastor in the oversight and government of the church. When the word is used without any qualification it is understood to apply to the latter class alone.

What word is used as a synonym for family?

1. Clan
2. Elders
3. Kinship
4. Patriarchal

Who would the leading men of the clan be?

5. The old men
6. The oldest males
7. The oldest male parents
8. The elders
9. The senate of elders
10. The head of the family
11. Those best able to deal with the question

What qualifications beside age are mentioned as necessary to supremacy of power in primitive society?

12. Birth
13. Kinship
14. Leadership
15. Must be a freeman
16. None
17. Parenthood
18. Religion
19. Sex

In what organization of present times is the word elder retained with the meaning of ruler?

20. Asia Minor
21. The church
22. The congregation
23. The Jewish church
24. The Presbyterian church
25. The patriarchal

What name would be given in the Roman Catholic church to the person having the duties of teaching elder in the Presbyterian Church?

26. Bishop
27. Deacon
28. Dean
29. Father
30. Pastor
31. Priest

What reasons are given in the paragraph for the wide use of the title of Elder in the early Christian church? (Check two.)

32. Acts vi
33. Its universal adoption
34. The Jews used it
35. The magistrates were called elders
36. The magistrates used it
37. The government was ecclesiastical

TEST 6

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

Against the rising tide of worldliness an opposition, however, now began to appear. It was led by what may be called the spiritual noblesse of Islam, which, as distinguished from the hereditary nobility of Mecca, might also be designated as the nobility of merit, consisting of the "Defenders" (Ansar), and especially of the Emigrants who had lent themselves to the elevation of the Koreish, but by no means with the intention of allowing themselves thereby to be effaced. The opposition was headed by Ali, Zobair, Talha, both as leading men among the Emigrants and as disappointed candidates for the Caliphate. Their motives were purely selfish; not God's cause but their own, not religion but power and preferment, was what they sought. Their party was a mixed one. To it belonged the men of real piety, who saw with displeasure the promotion to the first places in

the commonwealth of the great lords who had actually done nothing for Islam, and had joined themselves to it only at the last moment. But the majority were merely a band of men without views, whose aim was a change not of system, but of persons in their own interest. The movement was most energetic in Irak and in Egypt. Its ultimate aim was the deposition of Othman in favor of Ali, whose own services as well as his close relationship to the Prophet seemed to give him the best claim to the Caliphate.

Did the party of the opposition contain men who were working impersonally for the welfare of Islam?

1. Yes
2. No

Did it contain men who sought chiefly their own personal advantage?

3. Yes
4. No

What two sorts of nobles are contrasted?

5. Men of real piety and men without views
6. Men of real piety and men working for selfish ambition
7. Of Islam and of Mecca
8. Spiritual and hereditary
9. Spiritual and worldly

What two classes in one of these groups of nobles are specially mentioned? (Check two.)

10. Candidates for the Caliphate
11. Defenders
12. Disappointed candidates
13. Emigrants
14. Hereditary nobility

What apparent inconsistency is there in the two statements about the leadership of the opposition?

15. Opposition was against worldliness, but was itself selfish
16. The leaders were men of real piety, but they were selfish
17. The nobility was spiritual but purely selfish
18. Worked for selfish aims, later for Ali

What claims had Ali to the Caliphate? (Check two.)

19. A disappointed candidate
20. Hereditary nobility
21. His own services
22. His relation to Mahomet
23. The deposition of Othman

What was the name of the ruler against whom the opposition appeared?

24. Ansar
25. Koreish
26. Mahomet
27. Othman
28. He is not named

What was his title?

29. Ali
30. Caliph
31. Defender
32. Koreish
33. Prophet

TEST 7

Read the paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

H. K. Browne was famous as the illustrator of the best known books by Dickens, Charles Lever, and Harrison Ainsworth in their original editions. His talents in other directions of art were of a very ordinary kind. Most of Browne's work was etched on steel plates because these yielded a far larger edition than copper. Browne was annoyed at some of his etchings being transferred to stone by the publishers and printed as lithographic reproductions. Partly with the view to prevent this treatment of his work he employed a machine to rule a series of lines over the plate in order to obtain what appeared to be a tint; when manipulated with acid this tint gave an effect somewhat resembling mezzotint, which at that time it was found practically impossible to transfer to stone. The illustrations executed by Browne are particularly noteworthy because they realized exactly what the reader most desired to see represented. So skilful was he in drawing and composition that no part of the story was avoided by reason of the elaborateness of the subject. Whatever was the best incident for illustration was always the one selected.

In what was Browne most competent?

1. Drawing
2. Engraving
3. Illustrating
4. Painting
5. Sculpture

Does the paragraph give any evidence that Ainsworth was an important writer?

6. Yes
7. No
8. Unimportant

What evidence does it give that Browne's work was widely known? (Check the two best.)

9. He etched on steel
10. He illustrated Dickens' books
11. His illustrations are noteworthy
12. It says he was famous
13. Publishers used his etchings
14. The best incident was selected

What characterized Browne's choice of topics for illustration?

15. Elaborateness
16. He chose what the reader wished to see illustrated
17. Mezzotint
18. The story

What does composition mean as used in the paragraph?

19. Ability to include the best incidents for illustration
20. His illustrations covered the entire subject matter
21. Story telling
22. The entire picture
23. The general arrangement of a picture

What technical peculiarities are mentioned as characteristic of Browne's illustrations? (Check two.)

24. Composition
25. Drawing
26. Manipulating with acids
27. Mezzotint
28. Ruling with lines by a machine

What does the Greek word "lithos" mean?

29. Engraved
30. Engraver
31. Etch
32. Metal
33. Stone

TEST 8

Read this paragraph. Then read the questions. Make a check (✓) before the best answer to each question. Read the paragraph again as much as is necessary.

The conditions of persons entitled to relief are indicated by the terms of the statute of Elizabeth. If they fall within the definitions there given they have right to relief. A fundamental principle with respect to legal relief of the poor is that the pauper has no just ground for complaint, if, while his physical wants are adequately provided for, his condition is less eligible than that of the poorest class of those who contribute to his support. If a state of destitution exists, the failure of third persons to perform their duty, as a husband, or relative mentioned in the statute of Elizabeth, neglecting those he is under legal obligation to support, is no answer to the application. The relief should be afforded, and is often a condition precedent to the right of parish officers to take proceedings against the relatives or to apply to other poor unions. The duty to give immediate relief must, however, vary with the circumstances. The case of wanderers under circumstances not admitting of delay may be different from that of persons resident on the spot where inquiry as to all the circumstances is practicable. The statute of Elizabeth contemplated that the relief was to be afforded to the poor resident in the parish, but it is contrary to the spirit of the law that any person shall be permitted to perish from starvation or want medical assistance. Whoever is by sudden emergency or urgent distress deprived of the ordinary means of subsistence has a right to apply for immediate relief where he may happen to be.

To what country does the paragraph have reference?

1. America
2. England
3. Ireland

What general principle is stated in respect to the amount of relief to be given to any applicant?

4. Conditions of person applying
5. Must not be permitted to die of starvation
6. Not give paupers more than the poorest of non-paupers have
7. Pauper has no ground for complaint
8. Varies with circumstances

Why is the parochial restriction which was embodied in the law not enforced?

9. Because relatives must provide if they can
10. He has a right to apply wherever he is
11. Spirit of the law is against letting anybody die for lack of food or medical aid
12. Wanderers very often need immediate help

What general principle is stated in respect to what persons are eligible for immediate relief?

13. Pauper has no ground for complaint
14. Residents
15. Wanderers
16. Whoever is by sudden emergency or urgent distress deprived of the ordinary means of subsistence

How would it be ascertained whether an uncle was legally responsible for the support of an orphan niece?

17. According to the Statute of Elizabeth
18. Condition of the niece
19. Establish the relationship
20. Failure of a third person
21. If a state of destitution exists
22. Parish officers give her relief, then take proceedings against him

What does "Is no answer to the application" mean?

23. Is no answer to the application for relief
24. Is no excuse for not giving relief
25. Is no excuse to give relief

Who would "apply to other poor unions"?

26. Married couples
27. Parish officer
28. Paupers
29. Wanderers

Would they apply something or would they apply for something?

30. Something
31. For something
32. Yes.

What should the something be?

33. Food
34. Immediate relief
35. Repayment

Test 1		Test 2		Test 3		Test 4		Test 5		Test 6		Test 7		Test 8	
R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C
1	3	2	3	2	3	4	3	2	1	1	2	3	3	1	-1
7	-1	7	$1\frac{1}{2}$	6	-3	10	$1\frac{1}{2}$	4	3	5	1	5	-1	2	1
8	3	8	$1\frac{1}{2}$	8	-2	16	$1\frac{1}{2}$	7	$1\frac{1}{2}$	7	$1\frac{1}{2}$	6	1	3	1
9	1	11	3	12	3 if both rt. 0 if one rt. -1 if both x	18	1	10	$1\frac{1}{2}$	8	-1	8	2	4	-1
11	-1	13	3	14		19	3	15	1	9	$1\frac{1}{2}$	10	1	5	-1
13	3	17	3			23	$1\frac{1}{2}$	16	1	10	-1	11	2	6	2
17	3	19	-1			29	$1\frac{1}{2}$	19	1	11	-1	12	-1	7	-1
20	-1	20	-1	16	3	35	3	23	2	12	1	13	-1	8	2
21	3	21	-1	19	3	38	1	28	$1\frac{1}{2}$ if both rt. 0 if one rt.	13	-1	14	-1	10	3
22	3	22	-1	23	$1\frac{1}{2}$	43	1	29	-1 if both x	14	1	15	-1	13	3
24	-1	23	3	25	$1\frac{1}{2}$	45	1	33	$1\frac{1}{2}$ if both rt. 0 if one rt. -1 if both x	16	-1	16	-1	17	-1
								34		17	1	17	-1	19	$1\frac{1}{2}$
								37	1	19	3	18	-1	21	$1\frac{1}{2}$
								40	1	22	3	19	-1	22	1
								45	1	26	3	20	2	23	-1
										29	-1	21	-1	24	-1
												25	2	25	-1
												27	-2	26	1
												28	-1	27	-1
												29	-1	28	1
												30	3		
												31	-1		
												32	1		
												33	1		
												34	-1		
												35	-1		
												36	1		

KEY TO READING EXAMINATION III-S

The credit is 0 for all choices not entered below

The score is the algebraic sum of credits

R = the response chosen

C = the credit to be given

TEST 1			TEST 2			TEST 3			TEST 4		
R		C	R		C	R		C	R		C
1		-1	1	3		3	3		3	2	
2		-1	2	1		4	1		8	1	
3		-3	4	-1		8	3		13	3	
4		-1	5	-1		9	3		17	3	
8		-2	6	-1		12	-2		21	1	
12		3	7	-1		13	-1		22	3	
17		1	8	3		16	-1		26	3	
18		3	9	1		18	1		31	No. Rt. - 2 × No. X, but give no score below -2	
24		3	10	3		19	3		32		
25	trench	3	11	1		23	1		33		
26	vallum	3 if 3 right	12	-1		24	1				
27	standing stones	1 if 2 right	15	-1		25	1				
		0 if 1 right	16	1		28	1				
28		-1	19	1		35	1				
29		-1	23	3 if both right		38	1				
30		1	24	0 if one right		39	1½				
31		2	29	-1 if both wrong							
34		1	31	3							
				-1							

TEST 5			TEST 6			TEST 7			TEST 8		
R		C	R		C	R		C	R		C
1		3	1	1		1	1		2	1	
5		1	3	1		3	3		6	3	
6		1	8	3		6	1		7	-1	
7		3	11	3 if both right		9	2 if both right		9	-1	
*17	R -3 W +1		13	0 if one right		10	0 if one right		11	-3	
19	Give no score		15	-1 if both wrong		16	-1 if both wrong		13	-1	
	below -1		18	3		17	3		16	3	
24		3	21	-1		23	-1		17	1	
29		1	22	3 if both right			3		22	3	
31		3	27	0 if one right		26	3 if both right		24	3	
34	R -2 W +1		22	-1 if both wrong		28	0 if one right		27	1	
35	Give no score		30	1½		33	-1 if both wrong		31	1	
	below -2			1½			3		33	-1	
									35	1	

* Call 14 neither right nor wrong.

THE INTERPRETATION OF SCORES IN READING
EXAMINATIONS R AND S

Adults who have the ability to graduate from high school (by the standards in vogue in the northern states in 1920 to 1930) will, with a 60-minute time-limit, make scores ranging from 125 down to 35, with the average at about 75. Actual scores in 2,380 persons examined for college entrance run even below 35, but these very low records are probably from persons who graduated from high schools with very low standards, or from persons who realized that they could not pass the examination and relaxed their efforts in this, the third division of it, or from persons who were ill or upset or who had foreign language handicaps. The great bulk of the scores will lie between 45 and 100. The percentages of the 2,380 entrance candidates at each level of ability are shown in Table 12.

TABLE 12

The Distribution of the Scores of Candidates for College Entrance
(Columbia and Stanford) in Reading Examination
III-R or III-S

SCORE	FREQUENCY (IN PERCENT)	SCORE	FREQUENCY (IN PERCENT)
10-19	0.04	70-79	19.6
20-29	0.6	80-89	17.4
30-39	3.1	90-99	11.5
40-49	8.1	100-109	5.6
50-59	13.0	110-119	1.5
60-69	19.2	120-129	0.4

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